The Canadian
Medical Association Journal

Vol. XVII TORONTO, APRIL, 1927 No. 4

A Clinical Address
ON
SOME VARIETIES OF HEADACHE*

By Lord Dawson of Penn, G.C.V.O., K.C.B., M.D., F.R.C.P.

The London Hospital

IN the address I have the honour to present to you to-night I propose to deal with certain forms of headache which, however distressing, are compatible with, and often characterize, an active life. That is to say, I am excluding from my purview the headache, on the one hand, of structural diseases such as nephritis and intracranial tumour, and, on the other hand, the headache which is a feature of certain infections.

Headache is a term of variable significance—the variability in its intensity suggests the best classification of pain with which I am acquainted—namely, (1) pain which one can forget, (2) pain which one cannot forget, and (3) pain which makes one forget everything else. Moreover, its character varies: it may be described as pain; as unbearable pressure; as throbbing, splitting; as a band of compression.

The origin of headache must lie in structures which are sensitive to pain. The dura mater and its extensions like the falx cerebri and the tentorium and the anterior two-thirds of the scalp are supplied by the trigeminal nerves. The posterior region of the scalp and the dura of the posterior fossa are supplied by sensory fibres coming from the upper cervical segments. Tension or stretching of the dura would, as in the case of the parietal peritoneum, produce pain, whereas the brain, like the intestines, is insensitive.

How is this tension set up? The skull is a rigid container which closely fits the brain, and the spare space for the expansion of the latter is strictly limited. If for any reason the spare space is inadequate for the brain expansion, it is suggested that tension results and pain may follow, referred to within the cranium, and, it may be, the scalp. The expansion may be produced by increasing the arterial inflow or retarding the venous outflow or by a swelling of the brain substance (an œdema). Sudden exertion will produce arterial flushing, and lowering the head below the level of the body venous engorgement.

By others it is thought that vasomotor instability is the cause of headache attacks—that is, spasm of cerebral arteries followed by dilatation. Widespread and obvious vasomotor disturbance occurs in many cases of headache; contraction and dilatation of the retinal arteries have been observed during attacks of migraine. Moreover, the pinched features, the cold nose and extremities observed before an attack, followed by polyuria as the attack eases, are suggestive of a vasomotor causal factor. Spasm of arteries offers some sort of explanation of localization of headache to one side of the head, or to the frontal, temporal, or occipital regions, and such phenomena as hemianopia, and rarer manifestations of migraine like aphasia and paresis. The difficulty is that there is experimental evidence that the cerebral arteries are unresponsive to vaso-constrictor and vaso-dilator impulses.

* Delivered before the South Staffordshire Division, British Medical Association.

This address is being published simultaneously in the *British Medical Journal*.

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We must admit that the precise mode of production of headache baffles us. Any valid explanation must account for its occasional rapid appearance and disappearance. I may exemplify this by the quick onset of headache from sudden anxiety and the rapid disappearance after evacuation of the colon.

In one's doubts as to pathogenesis there is a tendency to fall back on the endocrine system. There is no direct evidence of the latter's share in this problem, unless perhaps in relation to pituitary headache. The ductless glands do, however, seem to be a liaison between bodily and mental functions, and with headache this interaction is frequently seen. It is possible that the mechanism of headache may be set in motion by chemical rather than nervous stimuli.

The incidence of headache is variable. On the one hand there is the man of middle or old age who has never had a headache, and on the other the subject who seldom goes two or three days without one. Between these two extremes there is every variation. And this leads to the reflexion that headache cannot be taken only as a measure of functional defect, but also as a feature of the patient's make-up or individuality; it is his reaction to environment. The same chain of events will lead to severe headache in one patient, slight headache in another, and in yet another no headache at all. Headache is like hyperpiesis: both are different varieties of responsiveness, of inborn trends which will develop or no according to the career of the possessor.

Given the innate nervous state with its characteristic impressionability and, with this a responsible anxious life or such accessory factors as eye-strain, digestive or metabolic faults, and migraine will be your portion: you are a victim of physiological predestination.

If we call to mind cases of headache which fall into my category—namely, those which are compatible with and often characterize an active life—either they accord with the classic descriptions of migraine, or are associated with disorders of the alimentary tract, or are the result of physical or mental exhaustion, of anxiety states, or other psychical conditions.

I seek to show that there is a close interrelationship between apparently different clinical pictures.

The conception of migraine has been clouded by the dramatic features of its classic form of attack or by over-emphasis of one or other of its manifestations. In one person there is the characteristic hemicrania, with or without visual phenomena; in another the headache is bilateral and is associated with nausea and vomiting; in yet another there is no headache and the manifestations are abdominal. The form may vary in the lifetime of one individual and in members of the same family. The cyclical vomiting of childhood may give place in the twenties to the classic hemicrania with its auræ, and this in turn may give place in middle life to recurring general headache associated with gastro-intestinal disturbance.

The clinical pictures are equally variable and suggestive. There is the disciplined man with a high-strung nervous system who has had a heavy week's work and perhaps is congratulating himself how well he has stood it. He plays a game of golf on Sunday. He may then plume himself on the fact that he is as young as ever and play a second round. He then eats freely. Then comes the downfall—migraine. What happens? He is a man in whom the burden of fatigue falls on his plain muscular tissue. As the week advanced his stomach and intestine lost tone and the functional capacity of digestion and metabolism deteriorated. The physical fatigue of the golf on the top of the week's duties lowered his blood pressure and put his digestion out of business. Here the sequence of events was: exhaustion—failure of digestion—toxæmia—headache. One round of golf followed by a light meal and recumbency would have done him good.

In very marked cases of gastro-intestinal responsiveness to fatigue, associated as they often are with low blood pressure, the only way is to let the man rest on the Saturday, take his exercise on the Sunday, and then he will be a king on Monday.

Let me give another example. A spare man of efficiency and conscience (this ilk so often suffers) works all day in the city, and in order to "keep fit" walks home, say, two or three miles at night. He complains of dyspepsia and frequent headaches of the migraine type. Why? The physical exercise following his mental labour was too much for him; the motility of his upper alimentary tract gave out, indigestion followed, and this provocation — perhaps a toxæmia — caused in a man with an inherent tendency to

headache migraine attacks sometimes conforming to classical description and at other times atypical. Had he not possessed this innate liability to headache, he would have been a flatulent dyspeptic, and perhaps had his appendix or gall bladder out, or had colopexy performed. If he had not possessed a gastro-intestinal tract over-responsive to fatigue he would probably have had recurring attacks of hemicrania with visual phenomena. What cured him? Driving home instead of walking, resting for half an hour in the recumbent position, careful attention to warmth of his extremities, and a dinner of light solid first-cooked food with a small amount of good wine. This patient took his exercise exclusively at the week-end and with benefit; he was one of those who could not stand physical and mental effort at the same time.

Such patients often do not tolerate cooked fats. This means that their hepatic capacity is naturally poor, or is rendered so for the nonce by fatigue. They can take uncooked butter and even cream, but not cooked fats, and the latter will sometimes produce acetonuria. This is one of the reasons why sodium bicarbonate in full doses is the best remedy for some cases of migraine. For cyclical vomiting alkali and glucose by the rectum are sometimes followed by striking success.

The order of the symptoms will vary. In some the gastro-intestinal upset precedes the headache and in others the reverse order prevails. A recent letter in the *British Medical Journal*, signed "Consulting Surgeon," describes the association of acetonuria with cyclical vomiting in one of his children and with migraine in himself. The former he cured by magnesium carbonate and glucose, and the latter he relieved by sodium bicarbonate.

I will pass to another clinical picture. Given a proclivity to headache, and a responsive abdomen and let it happen that the feet and hands become cold and the abdomen uncomfortable—beware! Warmth must be restored and only the lightest of food eaten. If not, the next movement of the bowel will be ineffective and the motion broken up. The bowel, though it opens, does not empty; there is retention of contents, the defences of the colon seem to weaken, and migraine—of classical or irregular type—will follow. If such a patient be given an ordinary aperient pill, especially a strong one, there is a liability of making him worse, for thereby the bowel is irritated and the defences further weakened, and he feels a worm—a condition described by the victim as "poisoned."

What happens? Provoked by cold, fatigue, or worry (and the worry need not be real, for these patients are sometimes of the "worritting" sort), there is spasm of arteries and of colon. The function of the latter fails—emptying is incomplete, toxic products get through, then follows headache. If no such proclivity to headache existed the patient would get an attack of so-called "colitis."

Abdominal Migraine.—A patient, aged 30, had periodic attacks coming on suddenly, and often in the night, with upper abdominal pain and vomiting. They lasted two or three days. A thorough abdominal exploration showed stomach, duodenum, gall bladder, and appendix to be normal. The latter was removed. Both the father and mother of the patient had been victims of classical migraine. Many such cases have been reported, and in some of them a phase of typical migraine attacks has given place to that of abdominal attacks.

Etiology.—In the understanding of the headaches we are considering, a number of factors, variable as to their presence and influence, have to be considered. These factors vary in different individuals and even in the same individual at different periods of life.

1. A proclivity to headache. Thus migraine is hereditary in more than one-third of the cases, and can sometimes be traced in one form or another through several generations.

Dr. Yeatman describes himself as "One of the fifth generation of sufferers, propagated through the female line, complicated by gout, and always precipitated by exposure to cold or irregularity of meals, preceded by a feeling of cerebral discomfort, closely followed by general headache, a boring throb at the back of one eye, subsequent sickness, and gradual recovery, accompanied by free secretion of watery urine."

2. Anxieties, fears, repressions, and other psychical conditions.

3. Fatigue and exhaustion.

4. Gastro-intestinal: proneness to fatigue, leading to failure of motility and perhaps secretion, as already set forth. The brain and solar plexus are in error, the proportion and order of their responsibility varying.

5. Hepatic insufficiency.

In some cases several of these factors may contribute, whereas in others one will dominate. Thus you may have the subject troubled neither by fatigue nor anxieties, but the liver can only deal with the lightest food and will not tolerate alcohol; such persons will have periodic attacks of migraine, have a tendency to high blood pres-

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sure, and in middle life substitute gout for their headaches, though in these days the acute gouty arthritis is less common. On the other hand, migraine may result from half an hour's acute anxiety without any apparent association with digestive or metabolic changes.

Diagnosis.—When we get beyond the precise boundaries and coherency of organic disease into disorders of function the aim of diagnosis is not to seek a label but to search out the why and the wherefore in each patient. The illness will be the result of reaction between external conditions and that particular patient's physiological and psychological make-up. The physician needs first to investigate the present disorder of function by all the tests at his command; next he must know the patient's physiological and psychological habit and workings; and lastly the circumstances of his mode of life and career.

I have given examples of states of body, and will now pass to the brief consideration of states of mind.

The victims of these headaches are often well educated and capable people in whom achievement counts for much, with the pride and hidden vanity that accompany its pursuit. At the same time they are sensitive to the dictates of conscience and duty, which easily become exaggerated and exacting. They thus keep their minds under the lash, and if fatigue supervenes they do not rest but lash themselves more. They strive for superiority; they try to avoid inferiority, and, if they fail, seek to disguise the fact from themselves by psychological pretext. If one adds that they are people of self-control and sometimes of reserve, it is easy to see that repressions and conflicts sometimes hidden under a plausible explanation lead to various failures of adjustment to daily life. Such "conflicts" come out in the pursuit of career, in sex relationships, in social ambitions. Headache is often an expression of the conflicts—with or without concurrent abdominal disturbance.

What the doctor has to do is to read and unravel the lines of force within the patient's mind when the latter is up against a concrete difficulty or trial. The treatment should be *ad hoc*. The doctor can then help the patient to understand himself, and point the way to the truth rather than crudely disclose it. So does diagnosis become the best treatment.

Treatment.—Treatment is in large measure a study of causes which are variable for different people but fairly constant for one individual.

In those people in whom the headache stands alone, and is the result of responsibility and stress, the day of rest is needed, but still more the right way of using it. So often the day of rest sees the same strenuousness and feverish activity as the day of work. It is relaxation which is needed, and its art requires study. Exercise to be beneficial must bear relation to the frame, physiological habit, and the week's work. There are times when the subject prone to headache needs a day or half a day in bed with windows open, the lightest of diet, and a diverting book. It is to be remembered that some headache victims have no twilight, no forewarning of fatigue, and in extreme cases their lives alternate between orgies of activity and prostration.

The best treatment is to show them the nature of the problem. In some cases an unusual somnolence, with or without yawning, in others an exaltation of fitness, may be danger signals, but often there is no warning. Some people must have fresh air. In the war many migraine subjects during their time in the trenches were immune from attacks. Eye-strain is an accepted exciting cause which needs no comment. Tobacco may be a cause, also alcohol, and—which is interesting—some victims are vulnerable to certain kinds of alcohol and not to others.

As regards the alimentary tract, I have already mentioned the importance of first-cooked foods, the avoidance of cooked fats, and in some cases restriction of sugar. Investigation in each case is needed.

People in whom the gastro-intestinal tract manifests their fatigue should be careful to be warm when eating and to partake of light food when tired. Many an attack could be avoided by such precautions.

A word on aperients. Patients who are strong, of the gouty type, and whose headaches are mainly due to hepatic insufficiency, are benefited by routine administration of calomel and saline every ten days, but for many, if not most, headache subjects strong aperients are harmful. The dose of salts which would cover a sixpenny piece or a shilling, in the early morning, is sound because it stimulates the ampulla of Vater, but no fuller dose. Castor oil in doses of 1 to 3 drachms once or even twice a week helps many,

and others can take the lighter aperients like cascara or senna.

I will not stay to discuss palliative measures —each subject must find his own best—an important thing, because the rule for the headache subject is to "carry on" if possible. Any palliative must be taken at the onset. Salicylate and bromide and sal volatile suits many. Phenacetin is invaluable; pyramidon for the few; cachet Faivre has staunch supporters, but is too depressing for some.

For those prone to acidosis sodium bicarbonate is the indication. Luminal is in some cases helpful, but its effects need watchfulness, because there are some patients it does not suit; thus now and then a blueness of lips may be noted, or again, a dullness or slight perversion of mental outlook.

Skilled massage of the head and neck, and manipulation which includes gentle traction of the head from the trunk, bring great relief to some people. But enough. Headache illustrates a problem which will increasingly occupy the attention of the medical profession—namely, the keeping of man in the path of "physiological righteousness."

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ÆTIOLOGY AND CLINICAL MANIFESTATIONS OF ANÆMIA*

BY DUNCAN GRAHAM, M.B. (TOR.)

Professor of Medicine, University of Toronto,

THE term anæmia, meaning a lack of blood, is used clinically to indicate a condition in which there is a diminished percentage of hæmoglobin in a measured quantity of blood with or without a diminution in the normal number of red blood corpuscles. Our attention is attracted to the anæmic state chiefly by pallor of the skin and mucous membranes in association with signs and symptoms, such as weakness, lassitude and shortness of breath. In certain types of anæmia, as Addison's (pernicious) anæmia, additional signs and symptoms sufficiently characteristic of a special type of anæmia are present to make a clinical diagnosis possible. I need only refer to the lemon tint of the skin, the periodic sore tongue, the nervous and gastro-intestinal disturbances so commonly present in Addison's (pernicious) anæmia to indicate what I mean. In the majority of cases of anæmia, however, the condition develops in the course of different diseases affecting various parts of the body and the clinical findings present are complicated by signs and symptoms due to the primary disease. In all cases of anæmia, therefore, it is of importance to determine whether the anæmia is due to disease primarily or secondarily affecting the blood forming organs; and if the latter, to what degree does the anæmic state contribute to the present condition of the patient?

Before discussing the interpretation of clinical findings in cases of anæmia it is well to consider a few facts with reference to the origin of the red blood corpuscles and the effects produced by a decrease in the amount of hæmoglobin. In post natal life the red blood corpuscles are formed in the bone marrow. Under normal

* Read at a symposium on anæmia, Academy of Medicine, Toronto, January 11, 1927.

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conditions the circulation is supplied from this source with a fairly constant number of red blood corpuscles containing a fairly constant amount of hæmoglobin. As these cells die from the normal wear and tear of work in the body they break up without freeing hæmoglobin in the circulation, and the fragments are taken up by the reticulo-endothelial system in the spleen, bone marrow and liver. Here the hæmoglobin is broken down into an iron containing portion —hæmatin, which is retained in the body for use in the production of red blood corpuscles, and an iron free portion which is converted into bile pigment, and later excreted by the liver. The chief function of the red blood corpuscles is the transfer of oxygen as oxy-hæmoglobin to different parts of the body for use in tissue metabolism. As the blood circulates through the lungs the oxygen of the air inhaled combines with the hæmoglobin of the red blood corpuscles which in turn are carried by the circulation to all parts of the body. The tissues receive their oxygen supply, not directly from the hæmoglobin but from that dissolved in the plasma. The amount of oxygen present in the plasma is dependent upon the percentage saturation of the hæmoglobin with oxygen, and not on the amount of hæmoglobin present. In cases of chronic anæmia with varying percentages of hæmoglobin, even as low as 30, the ratio of the oxygen content of the arterial and venous blood remains constant, irrespective of the percentage of hæmoglobin. These physiological facts afford an explanation for the clinical observation that patients suffering from pernicious anæmia, with a hæmoglobin percentage of 30 and a red blood count of 2,500,000, are very often able to do moderately heavy physical work without distress. With the slow development of the anæmia the body is able to accommodate itself to the new condition, in part by increasing the blood flow per minute, in part by the decreased viscosity of the blood, and by changes as yet not completely understood. With the hæmoglobin below 30 per cent these patients show signs and symptoms of deficient oxygenation of the tissues, as lassitude, weakness, shortness of breath on slight exertion or even while at rest. If the hæmoglobin falls much below 30 per cent symptoms of oxygen want become more acute and the transfusion of blood may be necessary for the relief of symptoms.

If anæmia develops suddenly, as after a hæmorrhage from a ruptured vessel, symptoms become acute when the hæmoglobin percentage falls below 50 per cent, and are usually grave at 30 per cent. In this instance the distress is not entirely due to the decreased amount of hæmoglobin, for the administration of saline by raising the fluid volume of the circulation gradually relieves it. Transfusion of blood by supplying not only fluid but an adequate amount of hæmoglobin completely relieves the condition present if further loss of blood is controlled by the ligation of the bleeding vessel. The more acute the development of anæmia the more readily will the patient show signs and symptoms due to deficient oxygen supply to the tissues.

In the consideration of the anæmic state physicians too often consider the deficiency in the amount of hæmoglobin and in the number of red blood corpuscles as due to increased destruction of red corpuscles in the circulating blood, rather than as the result of agents directly or indirectly affecting the bone marrow, the tissue or organ if you like, supplying the circulation with the required amount of red blood corpuscles containing a normal amount of hæmoglobin. Apart from the loss of blood by hæmorrhage in quantities sufficient to produce disturbance by affecting the volume of the blood, intra-vascular destruction of blood as a factor in the production of anæmia is nearly always of minor importance. Anæmia results from three main causes: (1) loss of blood; (2) increased destruction; (3) deficient formation. In the majority of cases it is a combination of two or all of these. Among ætiological causes of anæmia one recognizes: hæmorrhage, internal or external; infections; malignant disease; intestinal parasites and poisons known and unknown. Although certain of these agents, *e.g.*, benzol, always produce the same type of reaction, the effect produced by the majority of them is dependent upon the state of the bone marrow at the time of exposure.

Benzol is a poison more or less specific for the bone marrow, affecting first the platelets and the granular white blood cells, and later the red blood cells. As a result of deficient platelets bleeding is prolonged; later, as anæmia develops, bleeding from mucous membranes and in the skin occurs from the combined action of deficiency of platelets and the local effects pro-

duced on the capillaries by deficient oxygenation of the tissues as the result of the anæmia. The skin and sclera are pale; the urine is pale, urobilin being absent; bilirubin is absent from the blood plasma as shown by the van den Bergh test. Examination of the stained blood smear shows little or no signs of polychromasia. Reticulation is absent or less than normal. This is the clinical picture of an anæmia due to deficient formation of blood by the bone marrow.

If a moderately severe hæmorrhage occurs in a normal person the bone marrow responds by the outpouring of a new supply of red blood corpuscles. As the sudden demand far exceeds the normal daily requirement immature red blood cells, non-nucleated and nucleated, reach the circulation. Cells showing polychromasia and an increase in the number of cells showing reticular staining are to be found. In the course of three weeks there is usually complete recovery from the hæmorrhage: the cells in the circulating blood are normal in size, shape and staining reaction; no nucleated red cells are present. Should a hæmorrhage, with the loss of the same quantity of blood, occur in an individual suffering from a moderately severe attack of benzol poisoning, the bone marrow no longer responds in a normal fashion with a new supply of red blood cells for the circulation. There is little or no response on the part of the bone marrow and if the circulation is not furnished with a new supply of blood by transfusion the patient may die from the combined effect of the benzol poisoning and the loss of blood by hæmorrhage.

In patients in which increased blood destruction is the cause of the anæmia the skin is yellow, the urine dark, due to hæmoglobin or urobilin or both, bilirubinæmia is present, and if the bone marrow is responding, polychromasia and increased reticulation is present in the blood smear. Such is the type of anæmia found in hæmolytic jaundice, congenital or acquired, in the ordinary cases of pernicious anæmia, in acute malaria, etc. In the beginning an anæmia may develop as the result of increased blood destruction, but later as the bone marrow becomes fatigued and active regeneration fails, the clinical picture of an anæmia due to deficient blood formation may develop. In infections due to the streptococcus hæmolyticus anæmia may develop as the result of increased blood destruction, and if the patient lives long enough, progresses as an anæmia due to deficient formation of blood.

Sufficient has been said with reference to the character of the bone marrow response in anæmia caused by different known ætiological agents to show its importance in the clinical investigation of a case of anæmia. If anything beyond the very simple diagnosis of the presence of anæmia is to be expected one must be familiar with the clinical and laboratory findings characteristic of the anæmia due to increased blood destruction in contrast with one due to deficient formation of blood, the result of functional insufficiency or aplasia of the bone marrow, at the same time remembering that the character of the bone marrow response is affected by the condition of the marrow at the onset of the attack. Although these facts are of importance in the consideration of special types of anæmia, they are of particular significance in the diagnosis and treatment of the so-called secondary anæmias which are so commonly met with in practice.

There is a large group of cases in which the anæmia results from disease primarily affecting the hæmopoietic system. In one group anæmia occurs as a result of disease primarily affecting other elements in the bone marrow and secondarily the red bone marrow, as in myeloid leukæmia, acute or chronic, and occasionally carcinomatosis of the bone marrow, poisoning by benzol, arsphenamine compounds occasionally, and other as yet unknown bone marrow poisons. A proper interpretation of the cause of the condition and the diagnosis can be accomplished only after the recognition of the primary condition affecting the bone marrow. In another group anæmia results from disease of the red bone marrow, although other organs of the body may be affected in a more or less characteristic manner. In this group may be placed Addison's (pernicious) anæmia, hæmolytic jaundice, congenital or acquired, and probably other less clearly defined types of anæmia. The history of periodic sore tongue, anorexia, indefinite gastrointestinal disturbances not definitely related to meals or time of day, numbness and tingling of the extremities, or the presence of ataxia in a patient with a lemon tint to the skin, and possibly a history of relapses and remissions, makes the clinical diagnosis of Addison's (pernicious) anæmia reasonably certain, or at least suggests the examination of the blood and stomach contents to confirm the diagnosis. Although the

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agent or agents causing Addison's anæmia markedly affect the bone marrow, other parts of the body such as the tongue and nervous system, are also affected, producing signs and symptoms which, in combination with the signs and symptoms from an anæmia due to increased blood destruction, suggest the diagnosis of this special type of anæmia. A history of lassitude, of recurring attacks of a mild jaundice without itching of the skin occurring in a patient with normal coloured stools is sufficiently characteristic to suggest hæmolytic jaundice and this may be confirmed by an examination of the blood for fragility, the blood plasma for bilirubinæmia, and the urine for the absence of bile and the presence of urobilin.

In a third group suffering from anæmia a definite enlargement of the spleen is found on physical examination. The clinical problem becomes one of determining the cause of the splenomegaly. These cases are commonly diagnosed splenic anæmia, but more careful examination will usually divide the group into cases of hæmolytic jaundice, Banti's disease, Gaucher's disease, tropical splenomegaly due to malaria, etc., tuberculosis, syphilis, new growth, myeloid or lymphoid leukæmia, aleukæmia or Hodgkin's disease. In fact, there are very few cases that should be left with the diagnosis of "splenic anæmia." It is impossible now to go into the clinical manifestations or differential diagnosis of cases of anæmia with chronic splenomegaly, except to remind you that certain of these cases are due to diseases of the reticulo-endothelial system and although the spleen may appear to be chiefly involved, the disease may be already present in other parts of the body, particularly the liver. This explains why a recurrence of the condition occurs after splenectomy in certain cases of Banti's disease and Gaucher's disease.

Finally, there is a group of patients with anæmia of greater or lesser degree in which hæmorrhage from or in the mucous membranes or in the skin, or both, is the dominant clinical characteristic. In this group are to be found cases of anæmia belonging to all the other groups mentioned, but the clinical problem is one of determining the cause of the hæmorrhage, for this usually solves the cause of the anæmia, explains the development of hæmorrhagic manifestations and determines the indications for special methods of treatment. While it is true that in a certain percentage of cases of purpura little or no anæmia is present, the majority show a severe anæmia due to the fact that a common cause is responsible for both the anæmia and the purpura. The association of anæmia and purpura is usually the result of primary disease of the hæmopoietic system, as in myeloid leukæmia, benzol poisoning, less often due to secondary effects on the system from primary disease of other organs of the body, as in cirrhosis of the liver. Too often the clinician is satisfied to make a simple diagnosis of purpura with no attempt to ascertain the cause of the hæmorrhage. As a result the opportunity is lost for suggesting an effective method of treatment, or all the cases are subjected to a method of treatment, such as the administration of calcium, that can only expected to be of value when the purpura is associated with a deficiency of calcium in the blood.

In this brief review an attempt has been made to show: (1) That the diagnosis of the presence of anæmia is not difficult, but if the diagnosis rests there it is of little value to the patient or physician unless an attempt is made to determine the cause of the anæmia. (2) That the presence of anæmia indicates impairment of function of the hæmopoietic system, the result of disease primarily affecting this system or developing secondary to disease of other parts of the body. (3) That anæmia results from three main factors —loss of blood, increased destruction of blood, deficient formation of blood, or a combination of two or more of these factors. (4) That the findings obtained from examination of the blood mirror the reaction of the bone marrow. (5) That the causes of anæmia are hæmorrhage, infection, malignant disease, parasites, and poisons, known and unknown. (6) That the clinical manifestations of anæmia depend on whether the anæmia is of slow and insidious or sudden onset, whether it is due to loss of blood, increased destruction or deficient formation of blood. (7) That anæmia develops most often secondary to disease in other parts of the body and the clinical manifestations of the disease are due only in part to the anæmia, other signs and symptoms being associated with the primary disease present. (8) That certain types of anæmia show characteristic signs and symptoms. (9) That one group of the anæmias is associated with chronic splenomegaly, another with hæmorrhage from or in mucous membranes or in the skin.

THE TREATMENT OF PERNICIOUS ANÆMIA*

By Henry C. Wales, M.B. (Tor.)

Toronto

PROFESSOR BARKER in a paper on the etiology and treatment of pernicious anæmia,[1] read before the American Medical Association at Dallas, Texas, last April, began by saying that if one were pessimistic it could be said of this disease: (1) that we do not know the cause, and (2) that as yet we do not possess a cure. However, he hastened to say that while these statements were literally true, at the same time the outlook in this disease was not so hopeless as his words would make it appear—because real progress is being made not only in understanding the causes, but also in the treatment. While no specific remedy has been found, much can be done to relieve the sufferings and to prolong the lives of those unfortunate enough to develop the disease.

For the purposes of this paper I propose to review the treatment as suggested by the known factors chiefly concerned in its development and progress under the following headings:

1. Preventive.
   a. Heredity.
   b. Early diagnosis.
   c. Oral and general hygiene.
   d. Early removal of known foci of infection.
2. Symptomatic.
   a. To decrease hæmolysis.
      (a) By radium.
      (b) By splenectomy..
   b. To supply new blood and to promote regeneration of blood.
      (a) By transfusions.
      (b) By drugs.
      (c) By diet.

It is an accepted fact that heredity plays a part in the etiology. At least achlorhydria is now looked upon as either a congenital or as a preceding condition. It has been stated that pernicious anæmia occurs only in individuals who have achlorhydria, but according to an investigation made by Bennett,[2] at Guy's Hospital, it was found that *four* out of 100 healthy medical students showed a complete absence of hydrochloric acid at all periods. The fractional method of gastric analysis was employed.

Weinberg[3] examined 24 relatives of 12 patients suffering from pernicious anæmia. Of those examined 22 were children and 2 were adults. It was found that 9 of these children and one of the adults had achlorhydria at all times. One of the patients had 4 children and in 3 of these achlorhydria was present. It would seem then that achlorhydria is a fairly common condition in the families of those suffering from pernicious anæmia. Intermarriage of members of families in which the disease is known to occur is to be discouraged.

Diagnosis should be made early even before the signs of a serious anæmia occurs. Middle aged individuals who are prematurely aged or grey, complaining of recurring attacks of glossitis, of attacks of abdominal colic with diarrhœa and vomiting, of numbness and tingling of the extremities, and who are found to have no free hydrochloric acid in the stomach contents, should be suspected of being latent or early cases of pernicious anæmia.

Much may be done then to prevent the onset of the characteristic anæmia. There is no doubt that the disease is latent in many individuals who never develop it. The early treatment of oral and dental sepsis or of intestinal parasites and attention to general body and mental hygiene with plenty of rest may prevent its development.

When the disease is developed the general treatment is important; mental stress and fatigue hasten its progress and it is necessary therefore to secure as much rest as possible. During the severe exacerbations with pyrexia absolute rest in bed is essential. No definite rule can be laid down but it may be said that when the red blood count is below 2,000,000 and the hæmoglobin below 40 per cent the patient should be kept in bed. For those who can afford it, residence in a climate which has the most hours of sunshine and a moderate altitude is a valuable adjunct to the treatment.

As the two outstanding etiological factors in the production of this condition are: an increased hæmolysis of the red blood cells, and a decreased regeneration, one must naturally discuss the various means that have been found of

* Read at a symposium on anæmia, Academy of Medicine, Toronto, January 11, 1927.

value in combating the disastrous effects of this combination.

To Decrease Hæmolysis

The spleen is the normal hæmolytic agent; when it overacts it produces an excessive hæmolysis or destruction of the red blood cells. This is proven by their marked decrease in number and the variation in their size and shape, and by the appearance of urobilin in the urine. It has also been suggested that the spleen possesses some hormone which acts as a brake on the formation of the red blood cells by the bone marrow. To overcome this excessive action, which is continuous, except during remissions of the disease, the spleen may be removed or its excessive action inhibited by the use of radium.

Eppinger[4] who originated the operation of splenectomy, thought that a hæmolytic toxin originated in the spleen and that its removal would cure the condition. The immediate results were encouraging. Following the operation a distinct remission usually takes place, but unfortunately it doesn't check permanently the progress of the disease and the ultimate results have been disappointing.

The operation also is not without danger. The Mayo Clinic[5] reports 6 per cent operation mortality in a series of 50 cases, and Percy[6] reports 11 per cent mortality in a series of 77 cases. If done it should always be preceded by repeated transfusions until the red blood cells are 3,000,000 or more. It may be justified in patients below middle age whose general physical condition is fairly good and not complicated by extensive cord involvement.

Regarding the use of radium Tomanek[7] of Prague cites the results of radium treatment of the spleen in 11 cases of pernicious anæmia. In all his cases the spleen was definitely enlarged.

The spleen was found to shrink in size and distinct remissions occurred but the ultimate results were not a cure. He claims just as good results as are obtained by splenectomy without its dangers and mortality. It is also applicable to all cases.

To Supply New Blood and to Promote Regeneration of the Red Blood Cells

Drugs

1. *Iron* has not been found to be of benefit because owing to the excessive destruction of red cells the organs are already over-loaded with iron.

2. *Arsenic.* This drugs has always been and is still commonly used in the treatment. It is usually given in the form of Fowler's solution. There is no doubt it does at times appear to bring about a remission but whether this is the result of treatment or is the normal remission of the disease is not determined. Many competent observers say it does more harm than good and claim that it may usher in an aplastic type of anæmia which is non-regenerative and invariably fatal.

3. *Dilute Hydrochloric Acid.* The weight of evidence at present goes to show that achlorhydria is always present before the appearance of the anæmia. Owing to the absence of this acid, certain bacteria which would normally be destroyed in the stomach pass on into the small bowel and there produce toxins which bring about the syndrome which we call pernicious anæmia. It seems simple and rational therefore to supply the deficient acid. Much has been written on this aspect of treatment, and while exaggerated claims have been made as to its curative value, there is no doubt that it is a valuable aid in our treatment; but it is not a cure.

The normal stomach of an adult on ordinary diet secretes approximately 10 to 15 drachms of dilute hydrochloric acid daily. One can readily see then that the ordinary small medicinal dose of ten minims is useless.

It is right to begin treatment by giving ten minims in half a glass of water with each meal, but this must be gradually increased until the daily amount given more nearly approximates the amount normally secreted by a healthy stomach; that is, one to two drachms. This should be given in a glass of orange juice 3 to 6 times daily, half an hour before meals and during the meals. Good judgment must be used in the giving of this acid because some patients may have much distress from the exhibition of such large doses.

Transfusions of blood have been the sheet-anchor of treatment for many years by the majority of clinicians. Harold Jones[8] claims that better and more lasting results can be obtained from transfusions than by any other therapeutic measure.

The reason he gives for unsatisfactory results are:

Failure to cross agglutinate before each transfusion.
The use of improper transfusion methods.
The injection of too large amounts of blood.
Too long an interval between transfusions.

He recommends:

The direct method, using whole blood.
That the first transfusion (except in very urgent cases when 500 to 600 c.c. may be given) be 100 c.c.
That each subsequent transfusion be 350 to 400 c.c.
That the transfusions be given every 4 or 5 days.

His report on 30 cases so treated shows that 10 are dead and 20 are still living. The time from the first transfusion to date varies from a few weeks to 7 years. In 5 patients the blood has returned to normal three times. In 4 patients the blood has returned to normal twice. Thirteen of the 20 cases are able to-day to get about and do part of their work.

He does not claim any cures but says that life may be saved in urgent cases; that bad symptoms are relieved and that remissions are stimulated.

This is I think the universal experience with transfusions. The greatest objection to frequent transfusion is the expense.

J. L. Yates[9] reports the case of a man 65 years of age who received 113 transfusions over a period of 3 years. In all he received 52 litres of blood, some preserved, some citrated, and some whole blood. He also had a splenectomy. He died of pernicious anæmia.

Treatment by Special Diet

It has long been recognized that foods containing excess of iron and protein have been of value in treating anæmias. Beef-blood and bone marrow have been favoured, not because they had any special influence on the regeneration of red blood cells, but probably because they looked like blood and were known to give increased strength and health.

It remained for Whipple and Robscheit-Robbins[10] to demonstrate by a series of experiments on dogs who were bled, that certain foods possess the power to cause a more rapid regeneration of blood than others. They found that the blood of dogs fed on cooked liver and lean beef returned to normal rapidly whereas when fed on milk and carbohydrates they remained weak and anæmic. They also found that the feeding of lipoids or fats increased hæmolysis.

Following the work of Whipple and Robscheit-Robbins, Minot and Murphy[11] began feeding certain patients suffering with anæmia on a diet rich in liver and lean beef. They found that in all these cases marked improvement ensued. They therefore elaborated the treatment and have this year published an article detailing the result of this treatment in 45 cases of pernicious anæmia. Their results are most encouraging and while no claim of a cure is made, a distinct advance in treatment is undoubted. One important thing is that the treatment is simple and inexpensive and can be carried out by any patient at home.

The basic and most important part of their diet is 120 to 240 grms. of liver a day. At times sweetbreads or lamb's kidney may be substituted. They also get an equal quantity of lean beef or mutton. These meats are cooked enough to be palatable, but are not too thoroughly done. In addition the patients are encouraged to eat green vegetables containing from 1 per cent to 10 per cent carbohydrate freely. They also get fruit, oranges, grapefruit, peaches and strawberries. In addition to the foregoing, which is insisted on, these patients may take any ordinary starchy food such as bread, potatoes, macaroni and cereals, but the amount of sugar and fats is distinctly limited.

The only medication given is dilute hydrochloric acid, 1 to 4 c.c. half an hour before and during meals, the average amount being 15 c.c. daily.

The cases treated were in almost every stage of the disease: 12 in their first distinct relapse; 17 in their second distinct relapse, and 16 who had had more than two relapses.

The cases have been on this diet for periods ranging from a few weeks to two and a half years: 2 for more than two years; 9 for more than one year, and 18 within the last five months. Four patients have died. They were practically unable to take any food.

Five were only seen once and of these, three were improved and two were not. All of the others except three became rapidly better soon after taking the diet, and are still well. The three discontinued the diet. One of the first things noted was an improvement in the bowel movements. From diarrhœa they quickly began to have normally formed stools. The appetite increased and soon it was difficult to give them sufficient food. The blood picture improved quickly. There is a definite temporary increase in the reticulated cells (young red blood cells) and the red blood count later shows a marked improvement.

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The icterus index of the blood serum early begins to fall and in two or three weeks becomes normal. Inside of a month the yellow tint of the skin disappears. It is as yet too early to say how long this improvement will be maintained. I have seen one case that has remained well for nearly a year.

Summary

In a disease characterized normally by periods of remission which occur entirely independent of treatment it is difficult to properly value the result of any one therapeutic measure, unless one has the opportunity of following a large series of cases over a fairly long period of time. From what we have said, many different forms of treatment apparently have power to temporarily bring about a remission.

Until we know more definitely the real underlying cause, we cannot hope for a cure.

DIET OF MINOT AND MURPHY

1. Give 120 to 240 grms. of cooked beef or calves' liver daily; an equal quantity of lamb's kidney may be substituted occasionally.
2. Give 120 to 240 grms. of beef or mutton lean meat daily.
3. 300 grms. of 5 to 10 per cent green vegetables daily. Especially lettuce and spinach.
4. From 250 to 500 grms. of fruit, peaches, apricots, strawberries, pineapple and grape fruit.
5. About 40 grms. of fat in form of butter or cream, otherwise exclude fats and oils.
6. One egg daily and two glasses of milk.
7. In addition: ordinary food as much as the patient wants.

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THE SURGERY OF PEPTIC ULCER*

BY CHARLES K. P. HENRY

Montreal

PEPTIC ULCER, whether gastric or duodenal, *may be considered a medical disease, or may be considered a disease calling for surgical treatment.* The common complications, hæmorrhage and perforation, call for surgical intervention sometimes in the case of the first, and always in that of the second. Therefore I have arranged my subject so as to deal with the complications and their treatment first, and will later on discuss the ordinary operative procedures for curing peptic ulcer.

The reason I stress these two complications is because they so often are first seen by the surgeon as acute emergencies, demanding immediate diagnosis and prompt and skilful treatment to preserve life. The surgical treatment of an uncomplicated ulcer, nay even of an ulcer with other complications, may await a convenient time and place. Sir Berkley Moynihan says, "The perforation of a gastric or duodenal ulcer is one of the most serious and overwhelming catastrophes that can befall a human being. The onset of the symptoms is sudden, the course rapid, and, unless surgical measures are adopted early, the disease hastens to a fatal termination in almost every instance."

I have examined the last twenty-five cases of perforation occurring up to August 31, 1926, in the Montreal General Hospital, including public and private cases, and they serve sufficiently well to illustrate the symptoms and signs, the surgical treatment given, and the results obtained.

The early diagnosis is obscure in only an occasional case. I think there were only two cases out of the twenty-five which were doubt-

* A lecture delivered under the auspices of the Canadian Medical Association in several cities in New Brunswick, during the week of September 20, 1926.

ful when seen by a member of the hospital staff. The patient had, in 84 per cent of the cases, a history of gastric disturbance, "indigestion," "dyspepsia," etc., extending over months or years. In many a recent history was obtained just prior to perforation, in only four did perforation occur without warning. In a few cases there was a brief history of distress after meals, flatulency, anorexia, fear of eating, symptoms which rapidly increased until perforation occurred. Rarely, as in the last case of this series, perforation occurred, while motoring, without a single gastric symptom and with no history of prior gastric disturbance. Cases of perforation are nearly always in young male adults; only one case in the twenty-five occurred in a female. Perforation frequently occurs on an empty stomach, early in the morning, towards noon, or late in the afternoon, hence vomiting is infrequent, food particles are seldom present, but bile-stained fluid may be present, as also some blood. Hæmatemesis may precede perforation, and, as in typhoid ulcer, may occur days before. Pain, which is always epigastric and often accompanied by local epigastric tenderness at the duodenal point, precedes perforation, sometimes for a few hours, even for a day or two. A patient of mine, who was waiting for a hospital bed, had pain for some days, nearly a week, preceded by nearly a month's recurrence of gastric distress after meals. Under rest in bed, an ice bag locally, alkalies and Sippy diet, there was prompt relief of pain, and yet perforation occurred three days later at noon. Twice in the ward I have seen perforation occur while the case was being prepared for operation for a known ulcer, once the day before operation was set, once but an hour or two before operation was set. The onset of severe pain in a known case of ulcer often indicates an extending or penetrating ulcer.

The onset of perforation is sudden, even dramatic. One man, while washing his hands before dinner, cried out, fell to the floor and was barely able to crawl to his bed. The pain is intense, is relieved by nothing save morphia, and often requires repeated hypodermics. It is always at first in the upper abdomen, most often just above the umbilicus, and slightly to the right, and, as the fluid from the perforated viscus trickles downward to the flanks, most often to the right iliac fossa, it may, in an hour or two, simulate appendicitis. However, the pain is more severe, more persistent, and the sufferer almost invariably presents more or less shock. He is pale, anxious, suffers intensely, lies on his back, motionless as a rule, resists attempts to move him or turn him, and shows some pallor or cyanosis; and his skin is cold and moist. A frequent symptom is pain on breathing and he says he "can hardly get a breath." Movement of the diaphragm is limited by the pain induced. This respiratory pain and difficulty was noted in 20 per cent of the cases; in one case pleurisy was diagnosed for the first twelve hours.

The pulse is slow, as in shock, and rises rapidly as peritonitis spreads. The temperature is subnormal till later, and the picture is one of a serious intra-abdominal catastrophe. In the first twelve hours the thermometer is usually of as little value as it is early in appendicitis. An early white cell count shows a moderate leucocytosis, which rises rapidly, hour by hour, early in the course of peritonitis. The bowels may move, though they usually do not even with enemata, which increase the pain. The spread of peritonitis produces complete obstructive symptoms, vomiting and fever; and save from the history, a diagnosis then may be impossible.

The physical signs are characteristic. The abdomen in the first hour or two is retracted, often scaphoid; several times I have been impressed by the transversely contracted area above the navel. Duodenal perforation is the only condition, except intra-abdominal hæmorrhage, in which a board-like rigidity appears so consistently and so early. Tenderness is marked, at first localized, then spreading as the peritonitis spreads. A physical sign of early and great diagnostic importance is the lessening of the area of liver dullness. In every case of acute abdominal pain outline with a pen the lower level of liver dullness at your first examination. In almost every case, at the end of an hour or two at most, you will find tympany above your inked line. This is a pathognomonic sign of perforation in the non-distended abdomen. At first the flanks may be tympanitic, in an hour dullness may appear, later movable, first in the right flank and iliac fossa, and it means gross peritoneal soiling.

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In gastric perforation, much less frequent than duodenal, (only one in our twenty-five cases) the spread of peritonitis is quicker, more widespread, and the initial right-sided rigidity, pain and tenderness is replaced by bilateral general signs and symptoms. The interval from the beginning of symptoms to the time of operation is of more importance in perforation than in any other emergency save internal hæmorrhage, and the length of this interval will largely determine the life or death of the patient.

In twenty-three cases operated on there were three deaths, and all occurred where operation was not done until over twenty-four hours had elapsed after perforation. I state emphatically, that with modern surgical operative and post-operative treatment, *no* case of perforation should die when operation is done within a six-hour period and rarely within the twelve hour period. In the interval give the patient a submammary or an intravenous injection of 5 or 10 per cent glucose saline or normal saline, apply heat to the lower extremities and give sufficient morphia to relieve pain. Give nothing, not even water, by mouth; reduce the patient's movements to a minimum, do not give an enema, but hasten the preparations for operation.

At operation, preferably under general anæsthesia, make a right paramedian incision above the umbilicus, displace the right rectus outwards; then, on nicking the peritoneum, in over 75 per cent of cases, a puff of gas will be noticed with fluid, varying from serous, bile-stained to pus, depending on the time since perforation. Except in the rare case, the perforation is just distal to the pylorus on the anterior surface of the duodenum. It may be up under the liver, the duodenum adherent to it or to the gall-bladder, and occasionally adherent to the anterior abdominal wall. After cauterizing the ulcer, as advocated by Balfour, close it by a purse-string suture of No. 1 chromic catgut, or by through and through sutures, using a small round needle. Reinforce it by a second layer, and tack over it a tag of omentum, or approximate the gastro-hepatic omentum down over it. In every case where the patient's condition permits, and the operator's skill is good enough, do a posterior no-loop gastro-enterostomy. Remove the appendix if possible. In every case, by suction or swab, remove all fluid from between the liver and the diaphragm, and all the fluid in the flanks and pelvis. Except in the cases of advanced peritonitis close without drainage. Personally, after cleansing the abdominal cavity, I like to fill it with saline while suturing the peritoneum. This dilutes the poison, furnishes fluid to the patient, and decreases post-operative thirst. Place the patient in Fowler's position, give boiled water for forty-eight hours, or better for four days, then Sippy or Lenhartz diet, augmented by rectal salines. These cases rarely vomit and their convalescence is rapid and easy. Several recent cases have not shown even a post-operative temperature above 99 degrees, or a pulse above 100.

Gastric or duodenal hæmorrhage.—It is as alarming as perforation, more frequent and often fatal, though less frequently so than perforation. Hæmorrhage may occur without preceding gastric symptoms; it may be the occult bleeding of a duodenal ulcer, or the basinful of bright red blood of a gastric ulcer. In any case, increasing pallor, weakness and loss of weight, with the so-called "dyspeptic symptoms," call for a stool examination, when the benzidine test frequently will show positive evidence of a "leaking" ulcer. Fatal hæmorrhage may occur in a few hours in a patient with no gastric or duodenal symptoms. This happened last year in a patient, convalescent after a goitre operation, who was to leave hospital the next day. The association of peptic ulcer and thyroid dyscrasia has been described in recent articles.

The physician or surgeon will find that many cases of hæmorrhage occur in patients without their being aware of this complication. Unless warned when they are under treatment or observation, many patients do not recognize the evidence of smaller hæmorrhages. The daily observation of the stools in all cases of so-called dyspepsia will often result in the recording at odd times of a black stool, a partly dark and partly light coloured stool, and, what is equally suggestive of hæmorrhage, causeless, intermittent, loose stools which often are blackish in colour. Associated with these are periods of slight dizziness, not amounting to faintness, and accompanied by a feeling of lassitude, becoming "easily tired" and "lack of energy." A secondary anæmia, with its characteristic low

hæmoglobin reading, is often the only definite sign that hæmorrhage has occurred. The gross hæmorrhage, associated with marked pallor, breathlessness, restlessness, and other signs of general and cerebral anæmia, are, of course, easily recognized. These massive hæmorrhages, and the repeated large hæmorrhages over several days, constitute one of the conditions where the question of surgical intervention becomes of paramount importance. Massive hæmorrhages I fear more than perforation. The question of operation is debatable, but a single large hæmorrhage does *not* call for immediate operation. Repeated small hæmorrhages, or two or more large ones, often bring the patient to a point where operation seems to offer the only chance of life. In these cases a transfusion of blood may be necessary before operation is safe. A small transfusion of 200 to 250 c.c. of blood may, I believe, be given in any case of hæmorrhage with a prompt improvement and an increase in clotting time. Larger transfusions are dangerous, except just before operation is undertaken. I have seen patients, in whom no bleeding was going on, though they were pretty well bled out from hæmorrhage, have another, and fatal, hæmorrhage after a large transfusion of 500 c.c. or more. With the rise of blood pressure and increase in heart action, the temporarily occluded artery blew out its occluding plug. If operation is to take place the transfusion should be given three hours before, and if no reaction occurs, as it very rarely does in post-hæmorrhagic anæmia, one has a fairly safe risk for operation. At the conclusion of many gastric operations a transfusion, which will save many desperate cases, is necessary. In the grave secondary anæmia, which follows gastric hæmorrhage, we give, after hæmorrhage has ceased, small transfusions of 220 to 440 c.c. of blood, at five day or weekly intervals.

The treatment of hæmorrhage from an ulcer includes treatment of the ulcer itself. Moderate hæmorrhages require absolute rest in bed, ice to the epigastrium, quiet, nothing by mouth for forty-eight hours or better for four days, rectal glucose saline, 6 to 8 ounces containing 10 per cent glucose every six to eight hours, and small doses of morphia hypodermically to control peristalsis. Such treatment will usually be found effective. This should be followed by a careful course of proper dieting, and absolute rest in bed for three weeks. It is rarely necessary to use rectal feedings, as the glucose solutions are adequate. If the bleeding is occult treat it as an uncomplicated ulcer, by rest in bed, proper diet and alkalies.

When operation is undertaken for gastric hæmorrhage it must be executed rapidly, under favourable conditions, by a skilled surgeon, and what may be done at operation is necessarily limited. A gastro-enterostomy will *not* cure a bleeding ulcer; the ulcer must be found, destroyed by the cautery, or excised, or its vessels ligated and it enfolded and sutured. Then a gastro-enterostomy should be done. Excision of the ulcer area, or any other large operation, is seldom possible in dealing with cases of severe hæmorrhage. In the absence of *skilled* operative surgery the average case will do better with rest, ice locally applied, morphia, rectal salines, a small transfusion and good nursing. I would rather take my chances with this treatment than in the hands of the average operating surgeon, but with perforation I'll take my chances with any surgeon who will operate *soon!*

To check bleeding locally, I believe 10 minims of adrenalin in 2 drachms of water by mouth is of value, and it may be repeated in two hours. I fail to find any evidence of value in other drugs by the mouth. Horse serum and the various agents used to induce clotting, such as prothrombin, fibrinogen, coagulose, etc., are of value, perhaps, to the patient's relatives, if not to him, because something obvious is being done. In some of our cases a small transfusion has controlled bleeding that the preparations mentioned above have not arrested.

The late complications of peptic ulcer, such as adhesions, pyloric cicatricial stenosis, gastric retention, and hour-glass stomach need only to be mentioned and diagnosed to indicate the necessity for proper operative treatment. Chronic ulcer frequently becomes the seat of cancer. In the last month I have seen three such cases. On one occasion, in adjoining theatres, two abdomens were opened at the same time, each revealing inoperable cancer of the stomach. During the last year I have seen five cases of cancer of the stomach, in four of which the history indicated the presence of ulcer for years. There is no doubt, clinically

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or pathologically, as has been shown by W. C. MacCarty, that cancer is often engrafted on chronic ulcer. This is not sufficiently realized by either the laity or the general practitioner. Long standing cases of ulcer should be operated upon. The change in symptoms after several recrudescences in an ulcer case, especially in cases occurring in patients aged from thirty to forty years, should raise the suspicion of cancer in the mind of the medical attendant. The increasing weakness, and the loss of appetite and of colour is often indicative of cancer. Hesitation in advising and in carrying out of operation is fatal. When it is possible, the excision of cancer of the stomach is followed by remarkably good results. Excision should always be done when it is technically possible, rather than a palliative gastro-enterostomy, which so often is disappointing even in relieving gastric retention. For the treatment of uncomplicated gastric ulcer we may cauterize the ulcer, excise it, or enfold it by suture after ligation of the vessels supplying it. Follow this by doing a posterior gastro-enterostomy. Ulcers on the posterior wall of the stomach, especially if fixed to the pancreas, are difficult to deal with save by transgastric resection.

In duodenal ulcer, I question if posterior gastro-enterostomy alone is sufficient. One case in this series perforated thirty hours after such an operation, and died. Several cases have had hæmorrhage afterwards. If one cannot cauterize, or sew in the ulcer, it is better to do Polya's operation, which gives such excellent results. The duodenal stump is closed and the stomach anastomosed to the jejunum. This is the best procedure for pyloric stenosis due to scarring, or for a large ulcer with surrounding inflammation, adhesions or carcinoma of the lower third of the stomach. Hour-glass stomach may be also so treated. Sleeve resection is disappointing; sometimes a favourable result may be obtained by gastro-gastrostomy.

The after treatment of all gastric operations is important and easy. The patient should be placed in Fowler's position, and given rectal salines; for forty-eight hours boiled water should be given fairly frequently in small quantities by mouth, then for two or more days sterile, clear fluids, followed by Lenhartz diet for two weeks, and thereafter, for three months or longer, a graduated diet. Alkalies, Sippy powders, or soda bicarbonate, gr. x, after meals and at night should be given during convalescence. Milk of magnesia with paraffin oil is given as a laxative; purgatives are not given, and enemas are given only if required. Calomel may be given on the fourth and eighth days to produce a free bile flow. The skin sutures should be removed late, on the twelfth to fourteenth day, and, as healing is slow the wound should always be supported by adhesive straps. The patient may be allowed up in three or four weeks, allowed out in five or six weeks, but not allowed to work for another month. He is kept on a special diet for one year and is required to report to his physician once a month and to have a barium series about three months after operation.

Following operation there is one complication which occurs sufficiently often to make it worthy of attention. *Gastric dilatation* is characterized by projectile vomiting of large quantities of fluid, a rapidly rising pulse and *upper* abdominal distension; the patient looks sick and enemas are ineffective. If this is not promptly relieved death will ensue. The patient should be put down flat, turned on his right side, or the foot of the bed elevated to take the pull off the mesentery, the stomach washed out, and he should be given hypodermically 1/2 to 1 c.c. of pituitrin or infundin every four hours with an enema, and strychnine gr. 1/30 every four hours hypodermically to stimulate peristalsis. Nothing should be given by mouth for twelve hours. The gastric lavage should be repeated in six to twelve hours, and soon the patient is happy and comfortable again. This condition may occur after any abdominal operation, hernia operations, or even after a prostatectomy.

PAIN IN THE LOWER ABDOMEN*

By George E. Wilson, F.R.C.S. (Eng.)

Toronto

Part II†

TUBERCULOUS peritonitis, which usually gives rise to a chronic type of pain and is commonly associated with ascites, occasionally develops quite suddenly with severe abdominal pain accompanied by vomiting the exact cause for which it may be impossible to determine before the abdomen is opened. The low leucocyte count and a history of tuberculosis in the family may make one suspicious; on the other hand there may be frank pus about an acutely inflamed appendix with a leucocyte count of 6,000, although the count has been done by two different individuals. If there is a well marked leucocytosis in tuberculous peritonitis, ulceration is probably present.

Primary pneumococcic peritonitis occasionally occurs, and like the preceding variety will probably not be diagnosed until the abdomen has been opened, when the characteristic fibrinous exudate is seen. The pain and tenderness in the early stages may be, and usually are, most apparent in the right iliac fossa, thus further confusing the issue. The pulse rate will be higher and there is apt to be a very high leucocyte count. If there is an associated lung condition, some suspicion of the true nature of the peritonitis may be entertained.

During an epidemic of influenza, many cases are seen with lower abdominal pain and a certain amount of rigidity, and these may very closely resemble an acute disease such as appendicitis. The temperature is usually higher but the leucocyte count is much lower than in appendicitis, and the pain is more apt to be widely diffused. There usually will be present other manifestations of influenza, more particularly in the chest.

Occasionally, a peritonitis is caused by hæmolytic streptococci which have reached the abdominal cavity from some distant focus, not infrequently from about the naso-pharynx. There will usually be a history of sore throat for a few days followed by severe abdominal pain, which again may be more severe in the right lower quadrant. At operation nothing is found to account for the peritonitis. The prognosis is exceedingly bad.

In acute gastro-enteritis we meet with pain, vomiting and fever. The tenderness is more general and there is no real rigidity. A history of having eaten something which disagreed, may be elicited, and others may be similarly affected. Diarrhœa is common.

In typhoid fever there is at times fairly well marked pain in the lower abdomen more noticeable on the right side, and the appendix has occasionally been removed under such circumstances; but a careful history will probably reveal headache and malaise for some days previously; there will be no leucocytosis, and the Widal test may be positive. The cause of pain under these circumstances is most probably due to an inflamed gland.

Intussusception occurs almost exclusively in infants. In adults a polypoid growth is generally the cause. The onset is with acute pain in the abdomen which causes the child to scream and draw up its legs. There is no real rigidity, a tumour can practically always be made out and on rectal examination the typical red currant jelly is apparent. Early operation is the only treatment

Acute diverticulitis which as a rule involves the sigmoid, is responsible for a small percentage of the cases of acute lower abdominal pain. It gives rise to the same symptoms as an acute appendicitis, but they are met with in the left lower quadrant, not in the right.

Perforation of an ulcer of the intestine or the cæcum will give rise to acute peritonitis. If the patient be known to have an obstruction about the sigmoid the probability will be a per-

* Read before the combined meeting of the section of surgery with section of obstetrics and gynæcology, Academy of Medicine, Toronto, November 16, 1926.

† For Part I, Pain in the Lower Abdomen, see *Canad. M. Ass. J.*, March, 1927, xvii, 285.

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forated cæcum from overdistension, or a perforation at the site of the growth. There will of course be early rigidity of the involuntary type.

The lightning pains of tabes have been responsible for a goodly number of unnecessary laparotomies. It has been estimated that 10 per cent of all tabetics have been operated upon for abdominal pain. The pain in tabes is very sudden in onset, and very sharp but is of short duration as though the part had been touched by a lighted cigarette. Examination of the eyes and reflexes will reveal concomitant evidences of the disease.

In purpura there may be fairly severe abdominal pain. A search should be made for signs of any hæmorrhages, not neglecting the shins; the bleeding and clotting time should be taken, the platelets should be counted and the spleen examined for signs of enlargement; the diagnosis will then be apparent.

Lead colic will give rise to acute abdominal pain and unless recognized, the patient may be subjected to an unnecessary operation. The blue line on the gums is not always distinctive, but the changes in the red cells will certainly clear up the diagnosis. There is no real rigidity of the abdomen; simply tautness during the spasm.

Occasionally severe cardiac attacks are accompanied by pain in the lower abdomen during which the abdominal muscles are held very firmly. If this possibility be remembered and other evidences of cardiac disturbance looked for, the diagnosis will be evident. Should an embolus lodge at the bifurcation of the aorta it will give rise to severe abdominal pain. I have seen a ruptured abdominal aneurysm sent in for operation.

When we come to a consideration of chronic lower abdominal pain, we tread upon ground where the footing is not so secure. In certain areas we are quite sure of the way, but in others we are still groping about more or less in the dark.

Broadly speaking there are two places where such pain may exist, either inside the abdominal cavity or in the abdominal parietes, either back or front. If in the abdominal wall, the pain may be referred to that part from some distant focus; or the seat of the pain may lie actually in the wall itself. From a practical standpoint, disease of the wall itself is not of any great moment as the diagnosis is usually obvious excepting possibly the early stage of a hernia, and therefore the main question to decide is whether the pain is in the abdomen or referred from somewhere else.

Chronic obstruction is an example of easily recognized intra-peritoneal causes of pain. It is commonest in the neighbourhood of the junction of the rectum and sigmoid and is usually carcinomatous, but there is the possibility of a chronic diverticulitis. If the patient be over 50 and has had a gradually developing constipation with a distended cæcum from back pressure, a diagnosis of carcinoma is the more probable.

A gradually developing mass in the right iliac fossa giving rise to pain may be carcinomatous, actinomycosis, a hyperplastic tuberculous mass, impacted fæces, sarcoma of the posterior wall or an extension from a psoas abscess. Carcinoma of the cæcum is commonest after middle age, although when it commences in the appendix young people are most frequently attacked, and not infrequently they are operated upon for subacute appendicitis. It produces a chronic obstruction and if there is much ulceration, it is difficult to differentiate it from hyperplastic tuberculosis. The latter occurs most frequently however, in people under forty. Actinomycosis may be primary in the cæcal region. It is slow in onset and produces a hard mass which soon invades the abdominal wall, leaving multiple sinuses discharging pus, from which sulphur granules may be obtained. Should the mass be hardened fæces, gentle but prolonged pressure by the fingers will cause it to change its shape. In addition there will likely be similar masses elsewhere in the colon. Obstruction will not be a factor in a sarcoma of the posterior wall, at least not till very late. A skiagraph may show alteration in the bone as an extension from a psoas abscess. Examination of the back will probably reveal the cause.

Spasm of the colon is a rather common cause of chronic intra-abdominal pain. It is due to many causes but I wish to refer to only one, namely, that due to some special article of diet which may not necessarily be the same for each individual. The pain is of a dull character and may persist for hours at a time, but does not keep the patient awake. That it is due to chronic spasm is easily proven by the temporary cessation of the pain during the passage of gas.

It has been suggested that the reaction in the bowel is in the nature of anaphylaxis.

But where no mass can be felt, the problem is more difficult, and the first point which must be settled is whether the pain is inside the peritoneal cavity, or is referred from somewhere else. It is generally believed that when deep pressure is made over the cæcal area and pain is complained of, disease is present in the appendix; but is such a conclusion justifiable even when the individual complains of digestive disturbances? Most certainly not, because unless distended the appendix is not sensitive to pressure, and if the same amount of pressure be made when the abdominal muscles are rendered taut by an attempt to raise the head and shoulders, the same degree of pain is experienced in some of these cases, and in some the pain may be even greater. The conclusion from such a finding must be that there is no intra-abdominal cause for the pain, but that some abnormality of the nerves in the wall is responsible. Recently Professor Carnett has drawn attention to this point, and claims that in many cases he is able to find in addition a tender spot in the nerve exit farther back. Just what is the condition of the nerves in such cases it is difficult to say. In herpes zoster for example, there may be local pain and tenderness over the anterior abdominal wall, and until the vesicles appear it may be difficult to rule out some intra-peritoneal condition. We know, however, that the posterior root ganglion is the seat of inflammation so that in all probability there is only a neuralgic condition of the peripheral nerve. Further, in trigeminal neuralgia there is pain and tenderness in the periphery, yet section of such peripheral nerves shows no pathological changes, so that it seems safe to conclude that neuralgia of the abdominal nerves is the cause of the abdominal pain and the tenderness in the wall. The same is true of the posterior abdominal wall and it is this hypersensitiveness which explains much of the deep tenderness in chronic cases.

The more common conditions which may give rise to this referred type of pain in the abdominal wall may be stated as follows:

Pathological conditions of the spine are the most important and include such inflammatory lesions as Pott's disease, tumours of the bodies of the vertebræ, as well as of the cord and its membranes, osteo-arthritis, abnormal curves of the spine and fractures. Pott's disease requires no comment as its symptomatology is well known. Tumours of the vertebral bodies are usually secondary and the breast is the primary source in most of the cases. Osteo-arthritis is particularly common after middle life. It seriously interferes with the mobility of the spine, and when well developed will show in an x-ray plate. Deviation from the normal curves of the spine predisposes to pain because it demands an increase in the muscular effort necessary to maintain the body in an erect position. In the case of fractures there is the history of old injury; this too will be evident on the x-ray plate.

Nothing has been said as yet of a very common type of case. Women between the ages of twenty and forty with dragging pains in the right iliac fossa, and with unending digestive disturbances are the chief sufferers. They are constipated, are more often thin than fat, and they are never well. There is tenderness in the cæcal area or elsewhere, but the most pronounced sensitiveness is in the neighbourhood of a normally placed appendix. Text-books on surgery label this syndrome as chronic appendicitis, and the treatment recommended is appendectomy. In recent years, however, it has become only too apparent that such a procedure has not met with the success that was anticipated. In the meantime it has been observed that in many of these cases there were abnormal membranes about the right colon. In some there has been found a thin veil of highly vascularized membrane stretching from the parietal peritoneum across the right side of the meso-colon on to the large bowel and often apparently constricting it; or a somewhat tougher membrane higher up between the colon and the hepatic flexure which may be firmly bound together, while a thin type of band is not infrequently seen on the right side of the mesentery of the terminal ileum close to the ileocæcal valve, which may be sufficiently developed to interfere with the movements of the intestine. In many of these cases the cæcum is found free and rather thin and bluish in colour. The appendix may be more or less tied down, but is not distended. Here then obviously may be the cause of a patient's symptoms since these membranes assuredly in-

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terfere in a mechanical way with the intestinal movements. A vigorous onslaught upon the membranes followed and surgeons waxed eloquent in their descriptions of the colon bursting forth as from a prison when a Jackson membrane was divided, or the unfolding of the terminal ileum when a Lane's kink was severed. But in time it became apparent that the results were no better than when appendectomy alone was carried out.

We have mentioned the thin bluish and distended cæcum that many of this class of individual possess. It appeared to lack tone, was more mobile than usual, and in addition the radiologist reported that the barium remained in it for too long a period. Here then appeared to lie the cause of all the patient's trouble, and attempts were made to narrow the bowel by plication, and then fix it more firmly to the posterior abdominal wall. In some instances the radiologist reported the barium as having backed up from the cæcum into the terminal ileum, and attempts have been made to narrow the ileocæcal valve, but with no better results than after any other procedure.

If we ask ourselves why these well-intentioned operations have been disappointing, the answer, which I would give is that they are all based on the assumption that there is a mechanical interference of greater or less degree with the onward passage of the intestinal contents; but I submit that in the class of case under discussion there is no such obstruction. Slowness in the passage of a barium meal does not necessarily denote any mechanical interference. The only legitimate conclusion to draw from such an observation is that the meal is delayed beyond the average time. It does seem incongruous in one case to mobilize a fixed bowel and in another case with the same clinical picture to fix a mobile portion. The rabbit's colon resembles the human very closely in that it has longitudinal muscle bands and haustra. Dr. Shouldice has shown that if plication be performed, instead of the bowel being smaller at the end of six months it is very much larger and the dilatation increases up to a year at least, and microscopic examination reveals an atrophic or even an absent musculature opposite the plication. The rabbit is a vegetarian and therefore it may be objected that the same need not occur in man, but to say the least it is highly significant. If we are right in concluding that there is no mechanical factor in these cases and that operations designed to relieve such a factor are consequently misdirected, what explanation can be offered which will satisfactorily explain the condition? I believe such to be possible, and that the trouble is due to some abnormality in the nerve supply to the intestinal tract.

It is well known that the intestinal tube is supplied by two sets of nerves, one motor and the other inhibitory, the former comprising the various branches from the bulbo-sacral outflow —the vagus and pelvic nerves, the latter, the sympathetic. For a correct functioning it is necessary that a proper balance be maintained between these opposing sets of nerves in the same way that the flexors and extensors of the forearm work together to accomplish the maximum effort; there is synergic action, and if an answer be sought for this defect of balance in the autonomic nervous system we are driven to conclude that the present civilization is responsible. Such symptoms as we are considering are never seen in primitive races, and are not present in the virile types of to-day. It follows then that this type of individual has fallen behind in the race and has failed to adapt himself to the rapidly changing conditions which civilization has imposed. In particular this type has failed to develop an intestinal tube which will pass on its contents in reasonable time and without the aid of any artificial help in the way of purgatives. Once constipation is established a vicious circle follows from which the individual escapes with the utmost difficulty, for once the purgative habit is fully formed it is well nigh incurable. This suggests the rational line of treatment, namely a return to a more primitive life with a dietary that will ensure a sufficient bulk to the larger bowel and the inculcation of regular habits.

A word of caution should be spoken in regard to the interpretation of results obtained by such spectacular events as operations. It is an easy matter to report a series of cases in which a "cure" has been obtained after some operation, such as the removal of the appendix or other allied operations. But these people may be neuropathic and susceptible to suggestion. In addition they have had rest in bed with regular

and careful feeding, and nursing, and a more or less prolonged holiday, following convalescence; factors which to say the least cannot be easily laid aside in considering the "cure". Moreover if the operator be a particularly enthusiastic individual, his reported results are going to be better than those of the man with less enthusiastic fervour; it would even appear that in many instances it matters not what operation is done to get "cures", as was exemplified by a series reported in 1920 in which various gastric disturbances were relieved by an operation devised to section all the branches of the vagus found about the lesser curvature of the stomach. A wise man is he who is able to appraise at their proper value the different factors concerned in any "cure".

But while we are convinced that operation in the class of patient which we have been considering is contraindicated, it must be recognized that there are definite indications for removal of the appendix apart from an acute attack. If there has been a history of an acute attack, and subsequently the patient complains of discomfort in the right iliac fossa, the appendix should be removed. If the patient has an obsession that all her trouble is due to her appendix, that in itself is sufficient justification for operation, for assuredly she will not get well without operation. There is another argument though not a weighty one, in that if removed, the danger of an acute attack is obviated, and moreover carcinoma of the appendix cannot supervene. But the term chronic appendicitis used so freely and confidently in the past is beginning to possess a sinister meaning, and some eminent men claim to-day that it is nothing more than an expression of a neuropathic constitution. In any case an excellent rule to follow is never to diagnose chronic appendicitis, till all other possibilities have been excluded.

That the diagnosis of chronic abdominal pain is in many cases an extremely difficult problem is evident to all who have given thought to the subject, but even the most enthusiastic must admit that many of the operations designed for its relief are unsatisfactory. At any rate the eagerness with which some new operative procedure is seized upon is in itself sufficient proof of such dissatisfaction. Surgeons are sometimes so intent upon operation that they forget to realize that they are dealing not with a machine, but with an organism of the utmost complexity, whose lineage goes back to remote antiquity and which unfortunately has fallen heir to many of the vices as well as the virtues of the ages which have gone before.

Studies in Human Inheritance.—The medicolegal application of hereditary human characters in cases of disputed parentage, with especial reference to the blood groups, is discussed by Laurence H. Snyder, Raleigh, N.C. The blood groups, which have received most publicity as medicolegal aids, present a case in point. It has been shown that the blood groups are probably not inherited as two independent pairs of factors, but as a series of three multiple allelomorphs. This changes to some extent the medicolegal application of the groups. It does not invalidate any previous test, but makes the application even more strict. It limits the groups of the remaining parent to a smaller number of possibilities in cases in which a parent of group IV is involved. Only in such cases involving a parent of group IV is any change made. A table is given, showing all possible cases in which the blood group test can be used. In addition to the blood groups, other simple factors may be used in determining parentage. Eye colour is one of these. Blue eyes are recessive to dark eyes (brown or black). Blue eyed parents always have blue eyed children. Gray (hazel) is apparently a third allelomorph in the series, recessive to dark, but dominant to blue. Eye colour may be used in determining parentage. Another instance in which a human character lends itself to medicolegal application is the direction of hair whorl in the occipital hairs, clockwise is dominant over counterclockwise. Snyder says that by gradually accumulating such tests, the determination of disputed parentage will become more and more accurate. A man who fails in several such tests can be considered without doubt as not being the father, but the true father can never be identified by such tests as these. It can sometimes be said that a certain man is not the father of the child; it can sometimes be said that he might be the father; but it can never be said that any man is the father.—*J. Am. M. Ass.*, Feb. 19, 1927

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THE EFFECT OF INJECTION OF LIPIODOL AND THE RATE OF ITS DISAPPEARANCE, IN NORMAL AND DISEASED LUNGS*

By David H. Ballon, M.D., and Harry C. Ballon, M.D.,

Montreal

In previous communications[1, 2] the value of lipiodol as an aid to diagnosis, and as a guide in the treatment of broncho-pulmonary diseases was presented. Since the beginning of this work 18 months ago, over one hundred bronchoscopic intrapulmonary injections with lipiodol were performed. An adequate number of cases have therefore been studied to permit of the recording of some observations on the rate of disappearance of lipiodol from the normal and the diseased lung.

Four questions thus present themselves to our consideration:

1. Does the injection of lipiodol into a healthy or diseased lung produce any immediate untoward reaction?

2. Does the persistence of lipiodol vary in the normal and in the diseased lung?

3. Is the persistence of lipiodol in the healthy and in the affected lung, harmful, beneficial, or neutral?

4. What factors affect the rate of disappearance of lipiodol from the normal and the diseased lung?

The Normal Lung

When lipiodol is injected bronchoscopically into the lung of a healthy individual it causes no symptoms, and appears to produce no physical signs other than those of moisture over the injected area. These signs are of short duration. They last two or three days, are not associated with cough or expectoration, nor is there any disturbance of the pulse, temperature, or respiration curves. It therefore produces no immediate untoward reaction, and the only discomfort to be noted is that associated with any bronchoscopic examination.

Lipiodol has been observed to persist longer in the normal than in the diseased lung. In one instance it was observed to persist for a period of 8 months, and a small trace is still present. (Fig. 1.)

Fig. 1.—*Case 1.*—Normal right lung. 10 c.c. lipiodol injected; still present 8 months after injection. Patient of Dr. Edward Archibald. All Roentgen films by Dr. A. H. Pirie.

The persistence of lipiodol in the healthy lung, although it does not appear to be particularly beneficial, has not been observed to be harmful.

Cough and posture hasten the disappearance of lipiodol from the bronchi, but appear to have no effect after its diffusion into the alveoli; after this the true elimination is carried out by the lipolytic activity of the lung. It would appear that a considerable amount of the lipiodol is taken up by the lymphatics and collects about the hilus of the lung, where it often gives the radiological appearance of a calcified gland. It may likewise resemble an unresolved pneumonia or an exudative or miliary tuberculosis. (Fig. 2, 3, 4.)

It is therefore of extreme importance, in individuals who on Roentgen-ray, present such shadows, which are unsubstantiated by clinical history, signs or symptoms, that particular at-

* Read before the American College of Surgeons, Montreal, Quebec, Oct. 26, 1926. From the Bronchoscopic and Surgical Clinics of the Royal Victoria Hospital, Montreal.

tention be paid to the past history of a lipiodol injection.

Iodine has been demonstrated in the urine and sputum and has been observed in the gastro-intestinal tract. In this report only the disappearance of lipiodol from the lung, and not its true elimination, will be considered. We have found that over 50 per cent of the patients injected have swallowed some lipiodol which was visible on Roentgen-ray. None of the patients showed any signs of iodine poisoning. In two cases of carcinoma of the œsophagus 5 and 10 c.c. of lipiodol were injected without producing any ill effects.

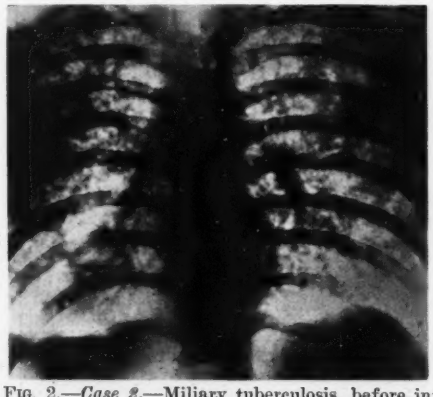

FIG. 2.—*Case 2.*—Miliary tuberculosis, before injection. From Department of Medicine, Royal Victoria Hospital, Prof. J. C. Meakins.

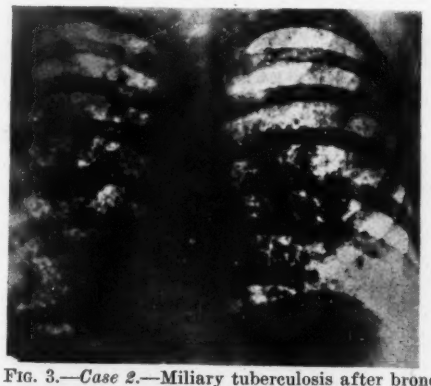

FIG. 3.—*Case 2.*—Miliary tuberculosis after bronchoscopic injection of 20 c.c. lipiodol. The underlying condition appears intensified; otherwise a normal injection.

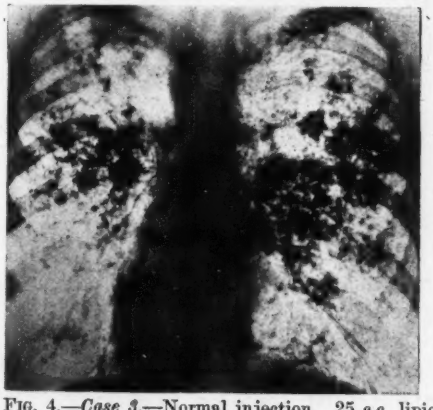

FIG. 4.—*Case 3.*—Normal injection. 25 c.c. lipiodol injected by bronchoscopic method, and immediately disseminated by coughing. Note the similarity it bears to miliary tuberculosis. Patient of Dr. D. L. Mendel.

EMPHYSEMA, PUTRID BRONCHITIS, VENOUS CONGESTION, NON-SPECIFIC ASTHMA

In these conditions lipiodol produces no immediate untoward reaction. It naturally persists for a greater length of time in the presence of stasis, than it would in pure emphysema or putrid bronchitis. In all these conditions the injection picture resembles that of the normal, and the rate of disappearance and the persistence of lipiodol are as in the normal. In its persistence the lipiodol may likewise produce the same pictures that we have already noted.

NON-TUBERCULOUS ABSCESS OF THE LUNG AND BRONCHIECTASIS

In non-tuberculous abscess of the lung and bronchiectasis no immediate reactions following the injection of lipiodol have been recorded.[3] Previously silent areas which are the sites of disease often give physical signs following the injection of lipiodol, particularly in bronchiectasis. One must also appreciate the fact, that fine terminal bronchiectatic dilatations often fail to fill immediately upon injection. Cough is infrequently temporarily increased. As each examination is preceded by an aspiration of the secretion within the tubes, expectoration is temporarily decreased rather than increased. The sputum is at first thicker, then usually thinner, for a few days after the injection. Those individuals who derive benefits from bronchoscopic treatment, derive the same benefits from the bronchoscopic examination which includes a lipiodol injection. One patient with abscess of the lung at the request of the attending physician was injected four days after a rather profuse hæmorrhage, without producing an increase in the "streaking" which was present at the time of injection.

Lipiodol persists in an abscess cavity for a short time, usually a week or two. The exceptions are in those cases where the cavity has a

narrow neck,[3] which is at a considerable distance from the mouth of a fair-sized bronchus. They usually fail to fill, and if they do, do so but incompletely. Bronchiectatic dilatations empty themselves very quickly; they are occasionally free of lipiodol in 24 hours.

The position of a cavity[4] and the size of a dilatation will naturally influence the rate of disappearance of lipiodol, as will the calibre of the bronchial tubes, their flexibility or rigidity, as well as the nature of the mucous membrane. An associated empyema, or pneumothorax, or an adherent diaphragm which has little respiratory excursion will naturally tend to delay the rate of disappearance of lipiodol from the lung. Cough will also get rid of a great deal particularly in bronchiectasis, as lipiodol in these cases often remains confined entirely to the bronchi. (Figs. 5, 6, 7, 8).

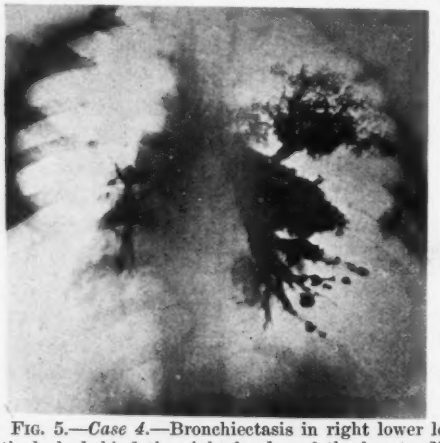

FIG. 5.—*Case 4.*—Bronchiectasis in right lower lobe, particularly behind the right border of the heart. Note the outline of the trachea, and the division of the right lung into three lobes. 25 c.c. lipiodol injected by bronchoscopic method. Patient of Dr. D. L. Mendel.

FIG. 6.—*Case 4.*—Bronchiectasis. Lateral on right side. Dilatations shown in posterior half at base; none in the anterior half. Some of the dilatations show fluid levels.

FIG. 7.—*Case 4.*—Bronchiectasis. Lateral on the left side, head down. Note the lipiodol in trachea, œsophagus and stomach. Roentgenogram shows the lipiodol jammed in the middle lobe as a result of posture and respiratory movements. If one was unaware of the conditions under which the picture was taken this shadow might be mistaken for an abscess cavity.

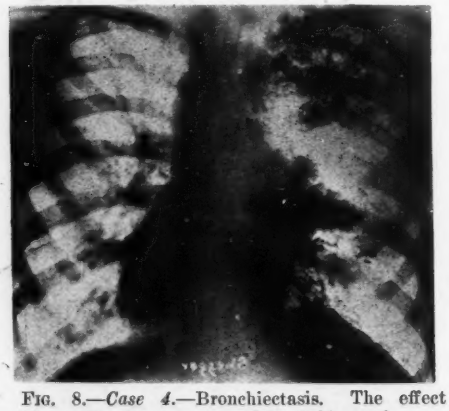

FIG. 8.—*Case 4.*—Bronchiectasis. The effect of coughing. Roentgenogram taken half an hour after injection showed lipiodol disseminated through the alveoli, while the bronchiectatic dilatations at the base were almost completely emptied.

In abscess of the lung, lipiodol does not appear to be directly beneficial.

In bronchiectatic[5] conditions it has not been observed to do harm, and in certain types of cases, where the injection picture reveals the typical clubbing or glove arrangement it is quite often beneficial, lessening cough and diminishing expectoration. Thus although it is the aspiration of a cavity or of a dilatation which

in reality produces beneficial results, no untoward reactions during any stage, such as one frequently observes following saline irrigations, have been observed following the use of lipiodol in abscess of the lung and bronchiectasis.

In two individuals with bronchiectasis following the injection of 40 c.c. of lipiodol, there was no increase in the basal metabolic rate, which is surprising as lipiodol contains 40 per cent iodine and the amount excreted per day is very small.

When lipiodol persists in an abscess cavity or bronchiectatic dilatation, it may present a fluid level, which can be affected by posturing the patient. In bronchiectasis, small amounts of lipiodol may sink to terminal dilatations particularly above the diaphragm, where it may arrange itself in typical bead formation.

Primary Carcinoma of the Bronchus

In one case of primary carcinoma of the bronchus with abscess,[6] small amounts of lipiodol persisted for over two months. It produced no ill effects, and did not disturb the patient who was bronchoscoped at least half a dozen times.

Pulmonary Tuberculosis

In pulmonary tuberculosis definite reactions have occurred from the use of lipiodol. As these have occurred only in certain types of tuberculosis, (Fig. 9) we will group them as follows:

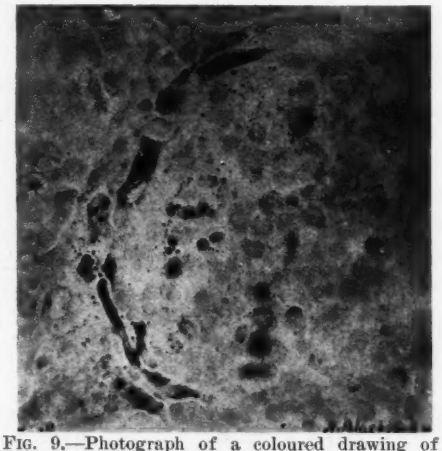

Fig. 9.—Photograph of a coloured drawing of a section of a lung with lobar pneumonia injected with lipiodol five days ante mortem. The section was stained with Scharlach R. and hæmatoxylin and shows the lipiodol mixed with the cells of the pneumonic exudate in small free droplets, and in fine granules. Lipiodol droplets are shown in the epithelium of the alveolar walls, and minute granules appear to link up the intercellular spaces into tessalated patterns. Lipiodol is present within the cell, surrounding the nucleus at some levels, and at others completely obscuring it.

(a) Exudative tuberculosis, including tuberculous pneumonias, and miliary tuberculosis.

(b) Chronic fibroid phthisis in which the underlying lesion may be one of tuberculous abscess formation with bronchiectasis and fibrosis.

(c) Tuberculosis after thoracoplasty.

In 18 cases of pulmonary tuberculosis demonstrating varied lesions, definite reactions were noted three times. In two of these instances the type of tuberculosis with which one was dealing was of the pure exudative type. Neither of these individuals should have been injected, as they were not only unsuitable operative risks, but it should have been appreciated that the injection would fail to give much information. Within six hours after injection, cough and expectoration were increased, there was a rise of temperature from 98.2 to 102, and the patient felt miserable. In one case this lasted for about a week. In the other patient, who was febrile before the injection, the condition was confusing, and she died ten days after a phrenicotomy performed under gas, which was exactly three weeks after the injection. The operation after the injection, and the fact that the patient was febrile before the injection naturally complicate the picture. Death could not be attributed to any one cause. Certain it is, however, that a lipiodol injection should not have been carried out in a patient with pulmonary tuberculosis whose physical signs showed widespread lesions and who was obviously not holding her own. Necropsy in her case showed extensive bilateral pulmonary tuberculosis, with patches of tuberculous pneumonia. Roentgenogram of her lungs failed to show any trace of lipiodol.

Lipiodol was likewise injected into three other patients with pulmonary tuberculosis who were febrile at the time of injection, and who had had hæmoptysis one month previously; in none of these instances did it cause harm.

One patient with miliary tuberculosis who was injected showed no reaction; while another patient in whom the diagnosis was questioned, and where at post mortem the lesion proved to be a bilateral tuberculous pneumonia, succumbed to what must be considered as acute cocain poisoning. Although skiagraphed before and after injection, the second skiagraph taken a few minutes after death, showed marked cardiac

dilatation; this may have been terminal. General Roentgen-ray of the body including the skull, failed to show any evidence of fat emboli.

In one case of fibroid phthisis with abscess and bronchiectasis, slight chest pain was noted. In this instance lipiodol was of value, and thoracoplasty gave an excellent result.

Those cases of pulmonary tuberculosis in which lipiodol is to be employed should show evidence of resistance as expressed by their history and by some fibrosis. They should be observed for a considerable time before injection, the comparatively normal side should not be injected, and only small amounts of lipiodol should be used. Lipiodol should not be injected into an individual with tuberculosis of the exudative type. Perhaps the reaction is due to circulating iodides, and is similar to the reaction which follows the administration of iodine for therapeutic purposes in tuberculosis. A lipiodol injection should likewise not be undertaken in an individual with pulmonary tuberculosis who is febrile, or who is fatigued after a long journey. This was undoubtedly the reason for a reaction in one instance. In other words if lipiodol is injected into a patient who is considered as suitable for a thoracoplastic operation, it is not likely to do much harm. For such a patient is usually thoroughly gone over before operation is considered. They usually have an associated bronchiectasis, so that but little of the lipiodol gets into the alveoli, but it remains in the bronchial dilatations which readily empty themselves. Lipiodol can thus be used with comparative safety in the surgical type of tuberculosis.

Six patients with pulmonary tuberculosis following thoracoplasty, were injected without producing any reaction. In no case of tuberculosis was the injection followed by hæmorrhage.

Lipiodol persists in that part of a tuberculous lung free of abscess, or bronchiectasis, just as it would in a normal lung. It has been observed two weeks after injection.

Those factors which hasten the rate of disappearance of lipiodol from abscess of the lung or bronchiectasis affect pulmonary tuberculosis, similarly, although apparently to a slightly less degree. For in pulmonary tuberculosis after thoracoplasty, where there are marked dilatations at the base of the lung, in addition to the ordinary mechanism which affects the rate of disappearance of lipiodol, a paralyzed diaphragm, as a result of phrenicotomy may retard its disappearance.

One must conclude that lipiodol may in certain types of pulmonary tuberculosis, not only produce an immediate reaction, but also that in its persistence it may produce some ill effects. In its persistence it usually presents a picture which is an intensification of the underlying condition, but where in reality the underlying pathological lesion is in most instances but little affected.

No true dissemination of a tuberculous lesion has been proven, although in one instance it had to be seriously considered. It does not seem likely that aspiration of the secretion from the bronchial tree in these patients does harm.

Diseases of the Pleura

In chronic diseases of the pleura, lipiodol is of undoubted value. It produces no reaction, when injected into a sinus or cavity, and rarely persists for more than a week. In its persistence it produces none of the ill-effects that one often encounters from the use of Beck's paste. It can be used in large amounts of 40 c.c. or more, with the assurance that it will not be retained.

Pulmonary Fistulas

Pulmonary fistulas can be clearly demonstrated, and with safety by bronchoscopic or external injection of lipiodol. It produces no reaction, and rarely persists for any length of time. In its persistence in an empyema cavity, the lipiodol tends to arrange itself in cannon ball formation throughout the fluid.

Lipiodol can likewise be used to inject bronchi communicating with an external wound, without any preparation on the part of the patient, and without producing any ill-effects.

We do not propose in this report to discuss at length our experiences with lipiodol on normal animals and animals in which experimental lesions have been produced. Suffice it to say that to date 35 rabbits (Fig. 10) have received lipiodol injections, and that in no instance did the injection of lipiodol into a healthy lung produce any immediate untoward reaction, or in its persistence, an inflammatory lesion. That the persistence of lipiodol varies in the normal and the diseased lung we have

been able to observe by producing pneumonic lesions, such as pneumonia, abscess of the lung, and pulmonary tuberculosis. These experiences are practically identical with those already noted, and are to be reported in detail.

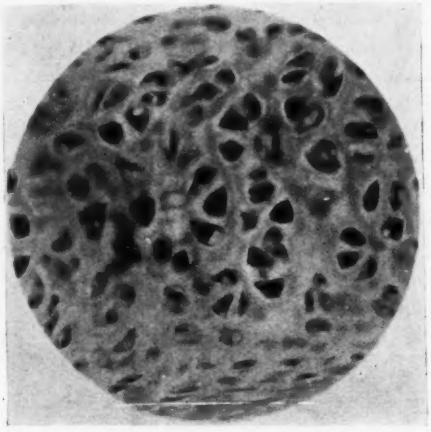

FIG. 10.—Photomicrograph of rabbit's trachea, showing lipiodol in the cells of the cartilage. Rabbit was anæsthetized with ether, the larynx exposed and 5 c.c. lipiodol injected into the trachea and bronchi. Eighteen days after injection rabbit was killed, and sections of trachea stained with Scharlach R. and hæmatoxylin. The mucous membrane shows only a few fine granules; most of the lipiodol seems to have passed directly into the substance of the cartilage, either completely filling its cells or pushing the nucleus to one side. The dark areas represent the lipiodol.

The so-called lipolytic activity, and the true elimination of lipiodol by the normal and the diseased lung have not been considered, but rather the rate of disappearance as determined by Roentgen-ray observations.

Conclusions

1. The injection of lipiodol is not harmful to the healthy lung, produces no immediate untoward reaction in man or animal, and persists longer than in the diseased lung. The rate of the true elimination in the normal and pathologic lung is influenced by the lipolytic activity of the lung; its disappearance from the bronchial tree is dependent on cough, posture, and other factors.

2. Lipiodol produces no immediate reaction in emphysema, putrid bronchitis, venous congestion, and in most cases of non-specific asthma; its persistence and rate of disappearance are as in the normal.

3. In non-tuberculous abscess of the lung no immediate reaction following the injection of lipiodol by the bronchoscopic method has been noted. It usually persists for a week or two, and is not directly beneficial.

4. In bronchiectasis no immediate reactions following the injection of lipiodol have been observed. Where the lipiodol remains entirely confined to the bronchi the dilatations aided by cough may empty themselves very quickly, occasionally in 24 hours; in bronchiectatic cavities with stasis the presence of lipiodol was still noted two months after injection. The rate of disappearance of lipiodol is influenced by the position of the bronchiectatic cavity, by the size of the dilatation, the calibre of the bronchial tubes, their flexibility or rigidity, as well as by the nature of the mucous membrane. In bronchiectasis lipiodol is not infrequently beneficial, lessening the cough and diminishing expectoration.

5. In primary carcinoma of the bronchus with abscess, lipiodol persisted two months without producing any ill-effects.

6. In pulmonary tuberculosis of the exudative type, and in tuberculous pneumonias, immediate reactions were produced and its persistence produced ill-effects. These patients should not be injected. Selected cases of the surgical type of pulmonary tuberculosis are usually suitable cases for injection, and do not produce any reactions. The persistence of lipiodol in a tuberculous lung free from abscess or bronchiectasis is about the same as in the normal lung.

7. In pulmonary fistulas, in chronic diseases of the pleura lipiodol produces no reaction and rarely persists for any length of time. In the presence of empyema, pneumothorax, or an adherent diaphragm which has little respiratory excursion, the rate of disappearance of lipiodol is delayed.

8. Roentgenograms showed that over 50 per cent of the patients swallowed some lipiodol. No iodism was noted.

9. Roentgenologically the presence of lipiodol in the lung may resemble an unresolved pneumonia or an exudative or miliary tuberculosis.

10. In the healthy lungs of thirty-five rabbits no immediate untoward reaction was noted, nor did its persistence produce any inflammatory lesion. The persistence varies in the normal and the diseased lung identically in the rabbit and in man.

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THREE CASES OF DIVERTICULA OF THE APPENDIX*

A BRIEF REVIEW OF THE SUBJECT

BY W. H. CHASE, M.D.

James Douglas Fellow and Lecturer in Pathology, McGill University, Montreal

DIVERTICULA of the intestinal tract are usually described as circumscribed dilatations of the lumen. Among them one may differentiate true and false, congenital and acquired types.

True diverticula are those in which the wall contains all the coats of the intestinal tract. A common example is Meckel's diverticulum, usually located in the lower half of the ileum. This class is nearly always congenital.

False diverticula are protrusions or evaginations of one or all of the inner coats of the gut through openings in the muscularis, so that the wall of the diverticulum consists of mucosa, with a somewhat variable muscularis mucosæ and submucosa, and is covered by the serosal coat of the gut. Hence these are often spoken of as mucous membrane diverticula. They are usually acquired.

Diverticula of the appendix all come under the class of false or mucous membrane type. Regarding their congenital or acquired character, opinions differ. Krabbel[1] claims that the former do not occur, while Schmincke[2] reports two cases of possible congenital origin. It may be that, while most of the diverticula in the appendix actually come under the division of acquired anomalies, developmental defects may act as a predisposing factor.

Frequency.—Moschcowitz[3] reports four diverticula of the appendix in 1,500 specimens examined, (0.26 per cent). MacCarty and McGrath[4] report 17 in 5,000 appendices, (0.34 per cent), while Stout[5] reports 1.89 per cent representing 5 cases in 264 appendices taken from operation material.

From September, 1925, till September, 1926, we made a routine examination of 394 appendices, from the surgical services of the Royal Victoria Hospital, and found *three* cases of diverticula, (0.76 per cent). During this period special care was taken in the gross examination of all appendices; longitudinal sections were made through the mesenteric border, and all suspicious looking protrusions on the surface were carefully examined grossly and microscopically. We note that similar careful examination methods were employed by Stout, and from our relatively high percentage the laws of chance seem to indicate a greater number than is generally recognized. The object of this article, then, is to briefly review and report three cases of this condition in the appendix, which might easily have been overlooked clinically and anatomically, and which may have an important bearing on the origin and the subsequent course of the inflammations of this organ.

Age.—The age incidence seems to vary from adolescence, as shown by Wilkie's[6] report of diverticula in a girl following carcinoma of the appendix with obstruction, to old age, as reported in a case of MacCarty and McGrath's.[4]

Size.—From a review of the reported cases, the size of mucous membrane diverticula is from 4 to 6 mm. in diameter. Brutt,[7] reports a case in which he found a pseudo-myxomatous mass the size of a hazelnut attached to the appendix and peritoneum, but on careful examination he

* From the Pathological Institute, McGill University, Montreal, Canada.

found that the mass was caused by a rupture of a diverticulum into the peritoneal cavity.

Sex.—Both sexes seem to be equally susceptible.

Etiological Factors.—Based on causation there are two distinct types of diverticula of the appendix: (1) those which occur through defects in the muscular coats as the result of enlargement of vessel openings; (2) those which occur through defects in the muscular coats as the result of an exudative inflammatory process.

Obviously this classification assumes as prerequisite, firstly, a defect in the muscularis, either congenital or acquired, and secondly, the presence of a force causing the protrusion of the inner coats through this muscular defect.

The presence of the vessel openings in the muscular coats can readily be observed grossly by making careful longitudinal sections through the mesenteric border of any normal appearing appendix obtained from an autopsy. A series of appendices examined in this way showed from four to six vessel perforations of the muscular coats in the mesenteric border, and half that number of slightly smaller perforating vessels in the antimesenteric border. A marked variation in the size of these vessel openings is also readily demonstrable. Microscopic sections show not only a variation in the size of the vessel openings, but also a variation in the size of the perforating vessels. Furthermore, some of the largest openings in the muscularis contain relatively small vessels and lymph spaces, and are surrounded by a plug of fat cells and loose connective tissue.

Fig. 1, is a transverse section of an appendix showing one of the largest of these gaps in the muscular coats. Boyd,[8] calls this an hiatus muscularis. It is interesting to note that the large opening in the muscularis contains a relatively small perforating vessel surrounded by fat cells and loose fibrous tissue. Ribbert,[9] and Aschoff,[10] both describe these collections of fat cells about the vessels, which shove the muscle bundles apart as they pass through the outer coats of the appendix. Thus Aschoff believes that when persons have experienced a rapid loss of fat from any cause, the diameter of the vessel openings is increased and at the same time the potential weakness of the muscular wall is increased.

Other explanations have been offered to account for the increased potential weakness around the vessel walls as they perforate the muscular coats. Aschoff[10] mentions also a congenitally weak muscularis which stretches and finally gives way, due to traction from without or pressure from within the lumen. Edel,[11] suggests chronic constipation with fæcal distension within the appendix lumen as a cause of increased tension.

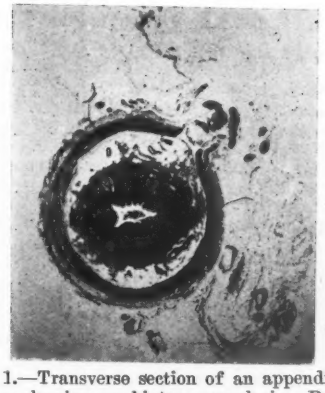

FIG. 1.—Transverse section of an appendix removed at autopsy showing an hiatus muscularis. Patient died of cerebral hæmorrhage and never had symptoms referable to appendicitis.

Although the cause of this increased potential weakness around the vessel openings in the appendix wall remains entirely speculative, a careful study of microscopic sections from Cases I and II leads us to conclude that the protrusions of the inner coats have taken place through enlarged vessel openings or hiatus musculares. The reasons for this conclusion are based on the microscopic findings that are attached to each pathological report and are demonstrated in Figs. 2, 3 and 4.

A force which is sufficient not only to dilate the vessel openings in the muscularis, but to cause the outpouchings in the wall of the appendix, is very difficult to prove. Stout[5] has done some valuable work on this problem. By experiments on dogs he has produced a false diverticulum by cutting down to the submucosa and then dilating the appendix with saline. From the results of his experiments he concludes that: (1) the contraction of the circular and longitudinal coats is probably the chief factor in driving the mucosa and submucosa through the weak point in the muscularis; (2) increased tension within the lumen tends to obliterate rather than to produce these diverticula.

We accept this muscular contraction hypo-

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thesis as the most likely force causing these outpouchings in the appendix wall in all three of our cases.

The second type of diverticulum is one which is the result of an exudative (acute) inflammatory process. Aschoff,[10] has described this type in detail. Abscesses in the wall of the appendix after healing by scar tissue may lead to distension and subsequent protrusions of the mucosa, forming a mucous membrane diverticulum. An acute inflammatory process may arise in the diverticulum as well as in the appendix, and these, due to their thin wall, are prone to rupture into the mesentery or peritoneal cavity. If they do not rupture they often produce scarring resulting in the production of stenosis phenomena due to the cutting off of the blood supply at the neck of the diverticulum. Case III is a good example of this type. The history and the gross and microscopic appearances of the appendix are all quite typical. Fig. 5 (Van Gieson's stain) shows well the extensive scar tissue replacement throughout the coats and at one place a nest of pus cells is seen in the dense fibrous tissue. The blood vessels at the neck of the diverticulum are markedly thickened and some are completely obliterated.

Conclusions

1. Our observations in a series of appendices removed at operation lead us to believe that this condition is more common than is generally realized.

2. This condition offers one explanation of the recurring, so-called subacute appendicitis extending over months or years, and terminating quite unexpectedly and rapidly by perforation which is otherwise unexplainable.

Protocols

Case I.—Mr. O. R., aged 30, married, teamster. Three weeks previous to admission he had a sudden severe attack of pain over the whole abdomen, accompanied by vomiting. At the end of three days this gradually subsided and he returned to work. Three days later he was again forced to quit work on account of abdominal pain in the lower right quadrant radiating to the right scrotum, and to the umbilicus. During the next two weeks he suffered similar less severe attacks of pain almost daily, lasting from two to four hours, not accompanied by vomiting. He was never constipated. He was well nourished, but not abnormally fat. On admission there was some resistance over the right abdomen and definite tenderness over McBurney's point, radiating to the right loin. Temperature 100° F. White blood cells numbered 6,800. Urine and kidney function tests were normal. He was cystoscoped and a ureteral catheter was passed to the pelvis of the right kidney with ease. Normal urine was obtained.

A diagnosis of acute appendicitis was made and appendectomy was performed.

The appendix was found to be turned up outside the cæcum. It appeared slightly inflamed with projection-like cysts or mucoceles on the distal third. The tip of the appendix lay almost on the lower pole of the right kidney. It was removed from the tip in the usual manner and the wound was closed. The patient made an uninterrupted recovery.

Gross Examination.—A slightly, uniformly curved appendix 8 cm. long. The surface of the proximal two-thirds is smooth and covered with engorged vessels. The distal third has five firm, smooth, nodular projections on its surface; two on the mesenteric border and three on the anti-mesenteric border. The largest is in the mesenteric border, and is 8 mm. in diameter, extending 4 mm. beyond the surface of the appendix. The others are somewhat smaller. Sections of the proximal two-thirds show a uniform diameter of 0.9 cm. The coats appear swollen and on longitudinal section the lumen is small and compressed but is patent throughout this portion. A longitudinal section through part of the distal third bisects two of the diverticula. A septum extends from the opposite wall into the larger of these two diverticula and contains tissue resembling the mucosa. We could not be sure if this septum was complete or not, but the fact that the lumen distal to the septum appears normal suggests that there is still communication either through a hole in the septum or by way of the diverticulum. At the tip of the appendix in the mesenteric free border is the fifth diverticulum. The walls and lumen in this area are bloody.

Microscopic Examination.—Transverse sections were made through the largest protrusion described above and a smaller nodular projection on the opposite surface of the appendix.

Figs. 2 and 3, show these sections which demonstrate the following interesting features:

Fig. 2 shows.(a) Above, an outpouching cut across the very end of a small diverticulum on the anti-mesenteric border. It illustrates well a diverticulum sac protruding through the muscularis and filled with areolar tissue, but is too low in the series to show a definite mucosa or communication with the lumen of the appendix.

b. Below, there is an outpouching cut across the beginning of a large diverticulum in the mesenteric border, which at this level does not show the hiatus muscularis, but contains definite mucosa and submucosa.

c. The absence of exudative or productive inflammatory tissue changes.

d. Numerous relatively large vessels at the neck of the diverticula.

e. Well developed muscular coats of the appendix.

f. Fig. 3 shows complete diversion of the mucosa and submucosa into the diverticulum sac so that the mucosa from the opposite wall is carried into the sac leaving loose fibrous tissue in its course. This tends to cicatrize and form a partial or complete septum. Due to the obstruction of the lumen distal to this septum these are prone to become inflammatory.

g. Relatively little inflammatory cell exudate throughout the coats.

Anatomical Summary.—Multiple diverticula of the appendix through hiatus musculares with relatively little inflammatory cell exudate.

Case II.—Miss M. G., aged 27, domestic. In October, 1924, she developed an acute attack of diarrhœa, vomiting, red blood-stained stools and generalized abdominal pain which was worse in lower left quadrant. These symptoms subsided following two weeks rest in bed. They

returned in February, 1925, and she came to the Royal Victoria Hospital. A proctoscopic examination showed the mucosa to be reddened, swollen and ulcerated. She was discharged, improved, on March 3, 1925. Diagnosis: ulcerative colitis of unknown origin. After two months rest she returned to work, and, except for dull abdominal pain, had fairly good health till January, 1926, when all the former symptoms returned. She again came to the Royal Victoria Hospital.

FIG. 2.—Transverse section of appendix from Case I demonstrating two opposing diverticula and features mentioned in the microscopic examination.

FIG. 3.—Transverse section from a lower level of same appendix block shown in Fig. 2, demonstrating complete diversion of the mucosa into the diverticulum sac.

Repeated proctoscopic examinations showed the mucosa to be intensely reddened, with weeping blood-stained, purulent material and showing small punctate ulcers from the rectum upwards as high as could be seen. On March 2, 1926, she was operated on. The rectum, ascending transverse colon and cæcum were found to be definitely thickened and hyperæmic. The appendix was very long and large and showed the same changes as the rest of the bowel. It was removed. Iliostomy was done by bringing up a loop four inches from the ilio-cæcal valve and sewing it together to make a spur. A tube then was put in the approximate end.

A good recovery followed and a proctoscopic examination showed the mucous membrane of the bowel much improved, but still a quantity of blood-stained fluid and pus on the floor.

Gross Examination.—The appendix was 7 cm. long, and appeared slightly, uniformly swollen. Losely attached to the serosal surface were several yellowish fatty looking nodules. Close to the tip on the anti-mesenteric border was a firmly attached, greyish, pea-sized mass extending .4 cm. above the surface.

Microscopic Examination. — Longitudinal sections were made through the tip of the appendix including the pea-sized surface projection. The sections as illustrated in Fig. 4 show the following interesting points:

a. An outpouching of the lumen through an opening in the muscularis which is lined by the diverted mucosa of the appendix.

b. A complete perforation of the wall with a protrusion of the mucosa on to the surface of the serosa forming a lip of mucous tissue around the perforation. This mucous tissue is continuous with that of the inner coat and on one side extends well out on the serosa.

c. Some proliferation of the mucosa from the opposite wall towards the point of perforation, which was confirmed by serial sections.

d. The submucosa, which is more closely attached to the muscular coats than to the mucosa, is only slightly protruded through the opening in the muscularis.

e. An hiatus muscularis containing a blood vessel surrounded by a plug of loose fibrous tissue.

f. Well formed vessels at the neck of the diverticulum and very little inflammatory cell exudate throughout the coats.

Anatomical Summary.—False diverticulum of the appendix through an hiatus muscularis with perforation, but showing relatively little inflammatory cell exudate.

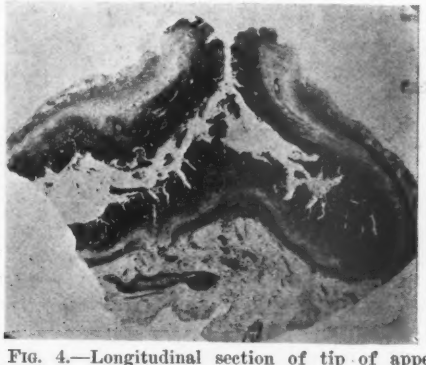

FIG. 4.—Longitudinal section of tip of appendix described in Case II, demonstrating features of diverticulum mentioned in the microscopic examination.

Case III.—Mr. C. R., aged 37, marine engineer. Patient gave a history of diffuse, dull abdominal pain for two months before April 20, 1926. On this date he had the first acute diffuse attack of pain, slightly colicky in character, which in a few hours became localized to the right abdomen. No other symptoms. About eight hours later a second severe attack of abdominal pain developed and he was brought to the Royal Victoria Hospital.

On admission he had tenderness over McBurney's point where a small sausage-shaped mass was palpable, evidently covered by the cæcum as it was tympanitic. This mass was not movable and did not fluctuate.

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Cystoscopy and right pyelotomy showed no abnormal findings.

At operation on April 30, 1926, the appendix was found densely adherent and lying surrounded by a small abscess to the outer side behind the ascending colon, the tip being on a level with the lower costal border. The appendix was thickened, perforated at the tip, and gangrenous, so that on removal it broke into several pieces. These were removed separately.

Gross Examination.—This showed no obvious diverticula in the specimens of tissue received.

Microscopic Examination.—Fig. 5 is a section of the appendix which shows the following interesting features:

FIG. 5.—Transverse section of appendix from Case III demonstrating the features of an inflammatory diverticulum as described in the microscopic examination.

a. An outpouching of the lumen through an opening in the muscularis which contains a mucosa continuous with that forming the inner coat of the appendix.
b. A markedly thickened submucosa due to proliferation of fibrous tissue which extends into the mucosa and muscularis. The former, therefore, appears compressed and the lumen is practically obliterated; the muscularis appears markedly thickened and irregular. Van Giesen's stain demonstrates well the extensive fibrous connective tissue infiltration of the coats.
c. Obliteration and thickening of the vessels at the neck of the diverticulum.
d. Small nests of leucocytes and pus cells throughout the coats, most numerous in the serosa.

Anatomical Summary.—Exudative, purulent and productive appendicitis with distal perforation, and proximal inflammatory diverticulum with stenosis and obliteration of vessels at its neck.

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Typhus Fever in the United States.—Is the louse to be exculpated from its time-honoured rôle as the transmitter of typhus fever? The United States is fairly free from this scourge of the old world except where an occasional immigrant brings it in or it creeps across the border from Mexico. Recent epidemics in the southeastern states, however, have aroused considerable concern among epidemiologists. Dr. Kenneth F. Maxcy, formerly assistant surgeon-general of the U. S. Public Health Service, has completed a survey of carefully collected data on typhus epidemics in Alabama between the years 1922 and 1925 that show that this disease when it shows itself here varies rather strikingly from the form known in Europe. In the first place, Dr. Maxcy concludes, in only one or two isolated instances could lice, the well-known carriers of typhus in the old world, be considered as the infective agents. The disease seemed to single out native white Americans of respectable station and contrary to precedent did not pick out the poor or the uncleanly. Nearly twice as many men as women were infected and the Negroes were almost entirely immune. In the second place it reached its maximum in Alabama in the summer and fall whereas typhus has long been associated in Europe with winter and early spring. There were not sharply localized neighbourhood outbreaks, continued Dr. Maxcy, but the evidence in hand indicated that people engaged in trade, especially those employed near groceries, feed stores and restaurants, were the classes most often infected. There was comparatively little secondary infections of other members of the same family, but several cases occurred on the same premises at widely separated intervals. Both from clinical and experimental evidence this disease seems to be identical with old world typhus but is milder and not so often fatal, according to Dr. Maxcy. The louse seems to be excluded as a carrier in America, but it is thought probable that some other agent, such as rats or mice, act as reservoirs of the virus and transmit it to man.—*Science Supplement*, Feb. 11, 1927.

HEREDITARY ABNORMALITIES OF THE EYE

III. (Section 2) Anomalies of the Entire Eyeball (Continued)*

By Madge Thurlow Macklin, M.D.

From the Department of Anatomy of the University of Western Ontario Medical School, London, Ont.

HAVING discussed the mode of inheritance of microphthalmus in the earlier section of this paper, we will now deal with the transmission of buphthalmus or hydrophthalmus and glaucoma.

In discussing *hydrophthalmus*, it will be well to define exactly the condition to which we refer. In some text-books of ophthalmology, the terms hydrophthalmus, buphthalmus and megalocornea are used interchangeably. Clausen[3] states that Horner in 1889 had distinguished between the conditions of hydrophthalmus or buphthalmus on the one hand, and megalocornea on the other; while Kayser in 1914 brought out the essential mode of inheritance in megalocornea as being distinct from that in hydrophthalmus. The points of differential diagnosis as enumerated by Clausen are as follows: (1) megalocornea is always bilateral; hydrophthalmus in unilateral in a third of the cases. (2) Megalocornea is found almost exclusively in the male sex, it being dependent upon the presence of a sex-linked recessive factor; hydrophthalmus is found about equally in the two sexes. (3) The megalocorneic eye shows a normal curvature, a clear cornea, and a normal iris; the hydrophthalmic eye reveals a definite decrease in the convexity of the cornea, the latter is hazy, and the iris is tremulous. (4) In megalocornea the pressure is normal, with the result that there is no excavation of the optic papilla; in hydrophthalmus the pressure is definitely increased, and there is an evident excavation of the nerve head. (5) Most important of all, the vision in megalocornea is normal; in hydrophthalmus it is subnormal or absent.

It must be recognized that there are cases of buphthalmus which are the result of injury or infections. It is of the congenital cases or those appearing in early childhood, which are idiopathic in character, that we are speaking. It is inherited, although there are probably many cases in which the inheritance is not evident. Johnson,[6] records the presence in three sisters of hydrophthalmus accompanied by hazing of the cornea and some loss of vision. Two brothers and one other sister were normal. The father, as a child, had suffered some defect of the left eye which had occasioned hazing of the cornea and blindness in that eye. This was probably hydrophthalmus.

Clausen[3] reports pedigrees by Argyll Robertson, in which a mother and three children were affected with this condition; by Vennemann, in which a mother and child showed buphthalmus; and by Wallenberg in which two brothers and two sisters showed the condition. Their father's brother and his mother had been similarly afflicted. (See Fig. 7).

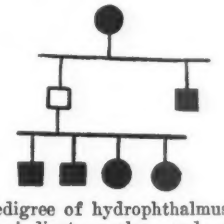

Fig. 7.—Pedigree of hydrophthalmus, after Wallenberg. Squares indicate males, and circles, females. Black symbols indicate affected members.

When we attempt to analyze the mode of transmission of hydrophthalmus we find that the number of pedigrees is small, and that the number of persons involved in any one pedigree is limited, so that it is difficult to state with any certainty just what the mode of transmission is. Clausen[3] quotes Vogt as suggesting that it is due to a recessive factor. In that case, buphthalmus would be comparable to blue eyes in its manner

* Part I, Laws of heredity and their exemplification in the inheritance of eye colour, *Canad. M. Ass. J.*, Nov., 1926, xvi, 1340. Part II, Inheritable defects involving the eyelids and their mode of transmission, *Ibid.*, Jan., 1927, xvii, 55. Part III, (Section 1), *Ibid.*, Mar., 1927, xvii, 327.

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of transmission, and both parents would have to carry at least one factor for its production before it could appear as an evident trait in the offspring (see Matings IV, V, VI, in Table I). Although we cannot state precisely the mode of transmission, we can say in this case, as in all inheritable defects, that persons afflicted with buphthalmus should not have children and that parents of one buphthalmic child should have no more offspring. It would be well for cousins, in both of whose families this defect runs, not to marry.

Although the defect is stated to be rare, the operative measures designed to relieve the condition, which is akin to glaucoma, are unfortunately not at all satisfactory. The deformity existing in the eyes, which makes the patient conspicuous, is sufficient to produce some mental perturbation, and the disease itself which means the loss of sight in one or both eyes beginning in very young children, is so tragic in its physical effects that there can be no question in the minds of the profession, at least, that reproduction should be refrained from by patients suffering from hydrophthalmus.

Glaucoma

Glaucoma, the disease in the adult which closely simulates the condition of hydrophthalmus in the child, is also due to increased intraocular tension, which, if unrelieved, results in diminution of visual acuity and finally blindness. The anatomical condition which has been looked upon as responsible for glaucoma is the blocking of the outlet for the lymph drainage of the eye through the canal of Schlemm, occasioned by either an infectious process which causes the anterior part of the iris to adhere to the posterior portion of the cornea, or to an initial defect in the structure of the eyeball in which the cornea as well as the rest of the optic globe is smaller than normal.

Glaucoma is for the most part a disease of middle life, although there are not wanting instances in which vision began to fail from this cause at eleven years of age. All the affected members shown in the pedigree in Fig. 8 lost their sight before they were twenty. Thus glaucoma may add its quota to the number of blind in our institutions.

Although it is evident that some cases of glaucoma may not be inherited, there is strong support for the idea that most of the chronic and some of the acute cases of glaucoma are hereditary. Nettleship[11] concluded that glaucoma was for the most part inherited, that it showed continuity of descent, that it was not transmitted by those who did not possess the disease, and that it showed "anticipation". By the latter is meant that the disease tends to appear at an earlier age in the children than it developed in the parents.

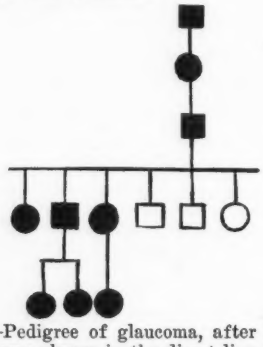

Fig. 8.—Pedigree of glaucoma, after Harlan. The transmission was always in the direct line, no unaffected person passing it on. Explanation of symbols same as in Fig. 7.

The occurrence of the inflammatory type of glaucoma is recorded by von Graefe through three or four generations; Kaufmann reports a family in which the chronic type had been transmitted as a dominant character through four generations, Clausen.[3] Calhoun[2] publishes his pedigree, and those of Howe and Lawford, showing the inheritance of glaucoma as a dominant character through three generations; Mott,[10] Nettleship,[11] and Rogman,[12] also have traced it through three generations; Arlt, Benedict, and Pagenstecher (Clausen[3]), have found six different families in which it has affected two generations.

The pedigree published by Harlan[5] (Fig. 8) is of a family in which the disease had descended through five generations, affecting males and females, and had been passed on by both sexes to their offspring irrespective of their sex. It was not transmitted by individuals who were free from the disease. As has been mentioned, this family began to be affected at quite an early age, so that when the affected members had reached the age of 20 they were blind.

Analysis of this pedigree shows that in this family, (and the same is true for practically all pedigrees of glaucoma) the disease was comparable to brown eye colour in its mode of

transmission, that is, the factor for the disease was dominant over the factor for normal eyes. By referring to Table I, the matings in this pedigree are similar to Mating V, in which a person, pure for the recessive character (in this case normal eyes), was mated to one who was a hybrid for glaucoma and hence showed the disease. Half the offspring from such a union are apt to be normal (pure recessives) and half affected with glaucoma (hybrids).

The three conditions dealt with in this paper are all serious, in that they cause either partial or total blindness. The records of one of our blind schools show that within the last five years 5 per cent of the admissions were for microphthalmus, and approximately 1 per cent each for hydrophthalmus and glaucoma. Physicians dealing with patients suffering from these conditions should endeavour to educate them along eugenic lines, thus rendering great service to the patients themselves as well as to the community.

TABLE I

	Parents				Offspring			
Mating	*Eye-colour of parents*		*Factors for eye-colour in germ cells*		*Eye-colour of offspring*		*Factors for eye-colour in germ cells*	
I	brown (pure)	brown (pure)	brown brown	brown brown	brown (pure)		brown brown	
II	brown (pure)	blue (pure)	brown brown	blue blue	brown (hybrid)		brown blue	
III	brown (pure)	brown (hybrid)	brown brown	brown blue	brown (pure and hybrid)		brown brown	brown blue
IV	blue (pure)	blue (pure)	blue blue	blue blue	blue (pure)		blue blue	
V	brown (hybrid)	blue (pure)	brown blue	blue blue	brown (hybrid)	blue (pure)	brown blue	blue blue
VI	brown (hybrid)	brown (hybrid)	brown blue	brown blue	brown (pure & hybrid)	blue (pure)	brown brown	blue blue

Table showing the six possible matings of blue and brown eyed individuals. (Reproduced from the first paper of the series, *Can. Med. Ass. Journ.*, 1926, xvi, 1340).

It is at once obvious that such a disabling condition as glaucoma should not be increased in the community. Persons in whom the glaucomatous condition arises should refrain from producing offspring if they have not yet done so, and from producing any more children, should they have offspring at the time the disease manifests itself. Smith[14] holds that the main cause for glaucoma is too small a cornea and eyeball, and that it might be possible to determine by corneal measurements in the children of a glaucomatous parent, those members of the family who are apt to develop the disease. Should this procedure prove of prognostic value, operative measures, such as iridectomy, could be performed before the disease manifested itself. These potential glaucomatous individuals could then be warned against the producing of offspring, before they reached a marriageable age, for of course, even should the preventive measures just outlined prove efficacious, would in no way interfere with the individual's capacity to transmit the factor for glaucoma to his offspring.

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OBSERVATIONS ON THE CHARACTERISTICS OF THE URINE IN DIABETES INSIPIDUS

By A. B. Illievitz, M.D., C.M., M.Sc.

From the Department of Biochemistry, McGill University, Montreal.

IN the course of the study of a case of diabetes insipidus special characteristics have been noted in the urine.[1]

Inosite was not found. Since the same observation has been made on urines from polyuria experimentally induced, the presence of this substance is not characteristic of the disease.

Creatinine was not found. When creatinine was not detected by the standard methods described in text-books, the writer, with the object of finding a more sensitive test for creatinine, repeated some of the experiments of Tiegs[2] on the colour test for guanidine bases, which is intended to differentiate between creatinine, creatine, methyl guanidine and dimethyl guanidine. The new test, with the modified nitroprusside reagent, also failed to demonstrate the presence of creatine and its anhydride.

Why creatinine was absent in the subject suffering from diabetes insipidus is difficult to explain. The probability which suggested itself was that, by the polyuria, the secreted acid was so diluted as to become unable to act upon the precursors of creatinine. Another was that the kidney cell proper has some function in the formation of creatinine. Muscular activity must also be taken into consideration. Muscular activity is usually regarded as influencing creatinine excretion. The patient was more or less at rest in the hospital for weeks, and in view of that fact, it is possible that diminished endogenous metabolism has something to do with it. Through the courtesy of Dr. Montgomery, of the Montreal General Hospital, the writer procured specimens of urine from a woman suffering from diabetes insipidus. The polyuria in this case was not so marked as in the previous one. Creatinine was definitely present. This patient, however, was at her home, up and about and working.

The chlorides are usually recorded to be increased in quantity in diabetes insipidus. The analyses made at the Royal Victoria Hospital[3] and those of my own[1] seem to show a decrease in chloride excretion. Starling and Verney[4] studied the secretion of urine on the isolated kidney. They point out that pituitrin causes a marked increase in the percentage and absolute amounts of chloride and a decrease in the amount of water eliminated.

The urine of diabetes insipidus apparently does not contain any substance which itself may be the causative factor of the polyuria. The injection of concentrated urine from diabetes insipidus into the circulation of a rabbit, gave results contrary to what were expected. One litre of urine was concentrated, by evaporation under negative pressure, to 250 c.c.; 2 c.c. of the concentrated urine were injected into a vein of the rabbit's ear twice daily for three days. The urine collected for seven days amounted to 1200 c.c. The experiment was repeated on the same rabbit two weeks later, and the urine collected for seven days amounted to 980 c.c. Prior to the experiment the animal voided 2370 c.c. in seven days. The interval between the first and the second experiment showed an increase of urine excretion. During the two weeks the urine amounted to 3740 c.c. One cannot arrive at any definite conclusion by using concentrated "whole" urine, but there is apparently no substance secreted in diabetes insipidus urine which may cause polyuria.

A substance of unknown chemical composition was isolated from the urine.[5] This was not found in the urine of the subjects in which polyuria was experimentally induced. The possible presence of this substance was suggested by the peculiar macroscopic changes in the urine on standing. The urine was collected in a winchester containing a few crystals of thymol. It was kept in a refrigerator for three weeks. On examination the fluid content of the whole bottle presented a purplish colouration. The sediment also showed a similar colouration. The specimen was further allowed

to stand for about two months. The above coloured substance deepened to a definite purple, and could be extracted with ether. The substance was isolated and found to be viscid, insoluble in water, but soluble in ether and chloroform; partly soluble in 75 per cent alcohol, but could be precipitated with absolute alcohol, forming a fine amorphous purplish sediment. Strong and weak acids do not affect it, but it is slowly and totally soluble in strong alkalies, forming a colourless solution, and can be reprecipitated by means of strong acids. Hydrogen peroxide in the presence of concentrated ammonia causes the evolution of a gas, the precipitation of an amorphous substance, which has a faint purplish colour and the formation of an oily substance which rises to the surface of the fluid and has a pink colouration. Neither an ethereal solution nor a slide of the ethereal extract show absorption bands in the spectrum. An attempt to establish its relationship to indican or tryptophane failed. The urine from which the unknown substance was extracted contained neither indican nor tryptophane. All other specimens of urine also failed to show the presence of these substances in detectable quantities. Two other specimens of urine also showed a faint purplish sediment.

Summary

1. There are apparently substances excreted in the urine that have not as yet been isolated.

2. The appearance of inosite is apparently not essential in polyuria.

3. The absence of creatinine opens a new field for study.

4. The urine in diabetes insipidus does not contain any substance which produces polyuria.

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Roentgen-Ray Diagnosis of Pleural Effusions, General and Local.—L. R. Sante, St. Louis, regards roentgen-ray examination of the chest of importance in the diagnosis and localization of pleural effusions. Fluoroscopy should never be relied on alone, however, for diagnosis, and should always be checked by radiographic examination. The roentgen-ray characteristics of pleural effusions are: In general effusions: When the lung is well areated and is freely movable: 1. There is a dense shadow occupying the lower portion of the chest. 2. The costophrenic sinus is obliterated. 3. The upper border is curved, concave, extending upward and outward from the hilum toward the axillary line, showing little, if any, change, on change of position of the patient. 4. There is displacement of the heart and mediastinal structures in large effusions, or, when these structures are not displaced, a persistence of the areation of the apex. 5. Diaphragmatic shadows are obliterated, and there is a continuation of the shadow of the effusion with that of the liver or spleen. When the lung is consolidated or fibrosed and has lost its resiliance: 1. There is a ribbon-like shadow along the parietal wall of the chest. In local effusions: 1. The entrapping of fluid usually occurs during the course of an inflammatory process. 2. The effusion may occur in any location where two pleural surfaces come in contact with each other; between parietal and visceral pleural layers; at the anterior, posterior or lateral chest wall; between diaphragm and lung, mediastinum and medial border or interlobar. 3. Whatever the location, the effusion produces one characteristic shadow—convex rounded border, with its base at the periphery, and the convexity inward toward the lung.—*J. Am. M. Ass.*, Jan. 22, 1927.

Dissection and microscopic study of two Peruvian mummies dating back to about 700 A.D. revealed examples of red blood corpuscles, quite fragile structures to have survived so long a time, it was reported by Dr. Herbert U. Williams, of the University of Buffalo. Dr. Williams also found by dissection arteries, nerves, muscles and tendons which could be readily identified. His findings, he stated, indicate that much could be done by study of such mummies to determine the diseases of early American races, especially diseases of the chest and abdomen.—*Science*, Jan. 28, 1927.

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BLOOD TRANSFUSION IN THE TREATMENT OF BRONCHIAL ASTHMA*

By W. T. McBroom, M.D.

Toronto

THE most common cause of asthma is an anaphylaxis to various proteins, animal, vegetable and bacterial. In addition to a strong hereditary factor, malnutrition and anæmia play an important rôle in the etiology of this disease. The anæmia is of two types: the first, a deficient hæmoglobin with a proper blood volume; the second, a diminished total volume of normal blood. One would naturally expect these two classes to be helped by blood transfusion if only from the stimulating effect of the foreign blood on the formation of new blood elements. There is also a possibility of changing the patient's protein sensitization. The introduction of blood from another person must surely cause changes in the blood of the person receiving the transfusion, (extreme care should be taken in the selection of a donor in all transfusion work). Ramirez[1] in 1919 reported an unfortunate incident; a man suffering from asthma due to horse dandruff was used as a donor, and two weeks after the transfusion, the recipient developed the same condition. If a patient can be given asthma by blood transfusion, it is possible that a transfusion from a proper donor will help a sufferer to overcome this affliction. Dr. A. J. Prentice very kindly assisted in the three cases reported. Two additional cases of Dr. Prentice's are included in this paper.

Case 1.—Jack H., aged 6 years, had a transfusion in May, 1924, at the Women's College Hospital. This little chap has never been very vigorous, having had gastro-intestinal troubles during the first year of life. He suffered from colds later and had his tonsils and adenoids removed when he was three years old. In April, 1924, he developed a severe cold accompanied by asthma. In May of the same year he had a return of the asthma. At that time he was thin, pale, irritable, and had a poor appetite. He did not respond to tonic and anti-asthmatic treatment and in desperation a blood transfusion was advised. The mother was selected as donor, both being in group II. The boy was given 350 c.c. of blood. He showed rapid improvement, the bronchitis and asthma quickly disappeared, and he was soon in apparent good health. Except for a broken leg, he has not needed any medical attention since. He is now a fine example of boyhood. The striking success in this case encouraged me to use this treatment in the next two cases.

Case 2.—Mr. T. C., aged 35, had never been very strong, having suffered during childhood from measles, mumps, whooping cough, pleurisy, and influenza. He had bronchitis practically every winter. He was fifteen years old when he had his first attack of asthma, and he has had it every year since, except one. The attacks were rather mild at first but have been growing worse each year. Last February, he had a very severe attack of asthma. It subsided but did not clear up, leaving bronchitis with dyspnœa. On March 11, 1926, a transfusion of 550 c.c. of blood was given, his father being the donor. They were both in group I. He began to improve at once, and in a few weeks he was feeling very well. He has not had asthma since, nor any colds. He does not mind the cold weather now, whereas he formerly felt the cold very much. His strength is greater, and he does not tire so readily. He finds that his nerves are stronger, and his appetite is decidedly better. In short he is improved in every way, and he has gained five pounds in weight.

Case 3.—Mrs. C., aged 46 years, underwent an operation in 1915 in which the ovaries and appendix were removed. She suffered from the ordinary diseases of childhood and several attacks of appendicitis prior to the operation.

Present Illness.—The asthma commenced seven years ago, gradually becoming worse. In 1922, she commenced treatment at the Outdoor Department of one of our city hospitals and continued there for one year. Because there was no improvement, she was admitted to the hospital and remained there for six weeks. Twenty-seven tests were made of her protein sensitization. She was negative to them all. An autogenous vaccine was made for her but it was not effectual. On discharge she was worse than when admitted. Last winter and spring, she needed three pillows on her bed each night, and even then would have to rise several times in the night to get her breath. This patient was first seen on March 22, 1926. Her hæmoglobin was 70 per cent. On April 7th, a transfusion was given, her sister being the donor, both being in group I. When 430 c.c. had been given, her breathing became very much embarrassed and the transfusion was stopped. She was given 15 minims of epinephrin (adrenalin). The second night after the transfusion, she slept the whole night through with just one pillow under her head. This was something she had not done in a very long time. Since the transfusion this patient has improved in every way, having gained at least ten pounds in weight. Her colour is good, her appetite is much improved, and she feels much stronger. She is expectorating much less than formerly, her headaches are gone, and her nerves are much stronger. She has had one asthmatic attack since the transfusion. She uses only one pillow each night now. If it were not for the emphysema resulting from the seven years of asthma, she would be quite a well woman.

* Read at the January meeting of the Toronto Alumni Branch of the University of Western Ontario. Also read at the February Meeting of the Toronto West End Physicians' Club.

Case 4.—Mr. McV., aged 35, a patient of Dr. Prentice's, had been operated upon for appendicitis and tonsillitis. As a youth he was strong and athletic, took part in bicycle races and won several medals.

Present Illness.—Asthma commenced ten years ago, the attacks coming on at night, especially in cold weather. Some spells would last for weeks. In August, 1924, he was given a blood transfusion of 600 c.c. The blood of the donor and patient was in group II. At that time he was underweight, and anæmic. Following the transfusion, he had no more asthmatic attacks but he did not feel altogether well. Some time later he had five unhealthy teeth extracted, one of which was abscessed. Following this, he rapidly improved in health, his gain in weight to the present has been 15 pounds. He feels very well in himself, and he has lost no time from his work.

Case 5.—Mr. T. H., a patient of Dr. Prentice's, aged 52, married about 25 years, by occupation a farmer, suffered from a very severe attack of appendicitis 30 years ago. He has been troubled greatly for the past 10 years with hæmorrhoids. He has suffered for years from asthma and hay fever. On June 8, 1926, he was operated upon for hæmorrhoids, and following the operation he was given 500 c.c. of blood, a nephew being the donor. His reply to the questionnaire of January 3, 1927, is interesting: Do you consider the hay fever improved during the summer months? Answer: yes. Did it leave entirely? Answer: no. Are the attacks of asthma during the fall or winter as severe as before? Answer: no. Do you still use adrenalin? Answer: I have used adrenalin only about seven times since last August. Before the transfusion I have often used adrenalin twice in 24 hours. Do you still inhale "Kellogg's" for asthma? Answer: I use about one-half as much "Kellogg's" as previously. I feel quite safe in saying the improvement I have felt since the transfusion to be at least 65 per cent, perhaps more but this is a good safe estimate. I have had practically no hay fever all summer, and in the fall just a couple of mild attacks. The asthmatic attacks are not nearly so severe, they come considerably less frequently and do not last so long.

Discussion

In the literature available, there was found no mention of the use of blood transfusion in the treatment of asthma. It would be unwise to make definite statements on the reports of 5 cases. To arrive at a safe conclusion the observation of many such cases for 5 years at least is required. Much can be learned from these 5 cases, however. The child and the two young men are well to-day and have had no recurrences. The two older persons are improved but not altogether free of their trouble. The recurring attacks of asthma invariably leave some degree of emphysema, and this in turn leads to changes in the right heart, so that a long standing case has damage that a transfusion cannot overcome. To even aid these patients and make their lives more enjoyable is worth a great deal.

Our hope is in the young, and it is here that we may do our best work. Our three younger patients failed to respond to all treatment prior to the transfusion. Following the transfusion, they all improved in health and have had no recurrences of the asthma. From this it can be inferred that their well being to-day is due to the transfusions they received.

Case 4 serves to stress the point that an endeavour should always be made to clear up all foci of infection, and so remove a condition that might possibly interfere with recovery. Their general health, and especially their mode of living should have careful attention.

In these 5 cases the transfusions were done by the direct syringe method and not by the citrate method. The therapeutic effect of unaltered blood seems superior to that of citrated blood. Where there is a family tendency to asthma, a donor should be selected from outside the family, and the donor's family should be free from all hay fever and asthmatic taint.

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Memories in rats after operations on the brain have been studied by Dr. K. S. Lashley, of the Institute for Juvenile Research, Chicago, and were reported to the American Psychological Association. Many of our universities in recent years have added departments of rodent-education in which the course is that branch of activity in which rats have shown themselves proficient in all ages, that is, finding their way through tortuous passages. The rat to be trained is put into one corner of an artificial maze and set to find his way to his food in some other compartment. When he is able to run rapidly through the passages without hesitation, turning into a blind alley, he is credited with having learned his lesson. Dr. Lashley has discovered that this acquired proficiency can be eradicated by cutting out certain parts of the brain, particularly in the parietal region. The larger the area injured the greater is the number of trials required for relearning the lost lesson. When the cerebral lesion is extensive more practice is necessary for relearning the maze than for learning it at first, but other and simpler habits are formed as quickly as ever.—*Science Supplement*, Jan. 28, 1927.

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THE MEDICAL ASPECTS OF EXOPHTHALMIC GOITRE*

By W. Magner, M.D., D.P.H.

St. Michael's Hospital, Toronto

EXOPHTHALMIC goitre is an interesting disease of obscure etiology and doubtful nature. Most of its symptoms are those of sympathetic stimulation and many of them occur transiently in healthy individuals as a result of violent exercise or of strong emotions such as fear or anger. Subjects of the disease show an increased nitrogenous metabolism and, commonly, a diminished carbohydrate tolerance. Structural changes are present in the thyroid gland, and usually in the lymphatic system, in the thymus and in the heart. It is generally believed that the disease is a manifestation of hyperthyroidism, this belief being based upon the microscopical changes in the thyroid gland and upon the result of thyroidectomy, which usually leads to a more or less complete, though perhaps temporary disappearance of symptoms. Plummer thinks that not only is there an excessive production of normal thyroxin, such as occurs with hyperfunctioning adenomas of the thyroid, but also an outpouring of abnormal, incompletely iodized, thyroxin molecules. This conception led him to a therapeutic trial of iodine, with most happy results.

The recognition of exophthalmic goitre may be very easy or, in its early stages or less typical form, it may be difficult. Many of its symptoms are present in other diseases and mistakes in diagnosis are frequent. Particularly in countries where simple goitre is endemic confusion may arise between exophthalmic goitre on the one hand, and on the other, such conditions as neurasthenia, toxæmia from focal infections, neuro-circulatory asthenia, early pulmonary tuberculosis, diabetes or heart disease. Hamilton and Lahey find that about 30 per cent of patients referred to their thyroid clinic fail to show any disorder attributable to the thyroid gland.

An individual suffering from exophthalmic goitre usually is under forty years of age. If the disease is well established, he may give a history of prolonged ill health with periods of exacerbation and remission of symptoms. He complains of nervousness, restlessness and irritability, of fatigue and muscular weakness, of palpitation and breathlessness on exertion, of loss of weight in spite of the fact that his appetite is excellent. He may suffer from periodical attacks of diarrhœa, vomiting and gastric pain. He probably will have noticed an enlargement of his thyroid gland and a throbbing sensation in his neck. He, or his friends, may have noticed increased prominence of his eyes. When questioned usually he will state that he has a constant feeling of warmth, and that he sweats easily, so that warm weather or warm rooms render him uncomfortable. His appearance is suggestive. His eyes have an unwinking staring expression, definite exophthalmos may be obvious. He is extremely restless or, in the absence of restlessness, his attitude suggests marked tension. Though in general cheerful and optimistic he is liable to emotional outbursts during which, as Plummer says, he may be as difficult to manage as a drunken soldier. His skin is moist and flushed. His temperature may be elevated slightly. His heart action is persistently rapid, extrasystoles or auricular fibrillation may be present. His outstretched hand and arm show a fine tremor. His finger nails may show trophic changes. His pulse pressure is high. His superficial arteries pulsate visibly. His thyroid gland is enlarged and firm to the feel, a systolic thrill may be felt over it and, on auscultation, a prolonged systolic murmur may be heard over its superior poles. His urine may show the presence of sugar and, after ingestion of glucose, his blood may show hyperglycæmia and a sugar curve with a delayed return to the fasting level. Estimation of his basal metabolic rate yields an abnormally high figure.

In the severer forms of the disease the patient

* Read before a combined meeting of the sections of medicine and surgery, Academy of Medicine, Toronto, December 14, 1926.

is liable to suddenly occurring crises or "thyroid storms." These are characterized by high temperature, extreme rapidity of pulse and respirations, vomiting and diarrhœa, intense physical restlessness, and delirium which may be followed by coma and death. The exciting cause of such a crisis may be an intercurrent infection or any severe physical or mental strain. It is most commonly encountered as a result of improperly timed surgical interference.

In the typical form which has been described exophthalmic goitre can be recognized almost at a glance. Often, however, the picture is not so clear cut. Symptoms such as nervousness, fatigue, tachycardia, gastric disturbances and vasomotor disturbances are present in many disorders, and if the characteristic triad of a persistently rapid pulse, an enlarged hypervascular thyroid and bilateral exophthalmos is not well marked, the true diagnosis may not be suspected and the crucial test, an estimation of the basal metabolism, may be omitted.

This procedure, estimation of the basal metabolic rate, is of the utmost value in doubtful cases. In the absence of fever a reading 20 per cent above normal is indicative of hyperthyroidism, this term being used to include exophthalmic goitre and toxic adenoma of the thyroid. The test, however, is not universally available, and it is to be remembered that unless it is carried out by a skilled operator employing the most accurate methods the result may be misleading. Even under such circumstances it may be dangerous to base a diagnosis, in a doubtful case, upon the result of a single test. The state of anxiety and trepidation induced in a nervous patient may be responsible for a reading definitely above normal, and it may be necessary to repeat the test on several occasions until the patient becomes familiar with the procedure, and errors due to induced nervousness and restlessness can be eliminated.

The gradual development of bilateral exophthalmos is one of the most characteristic signs of exophthalmic goitre. This condition is due to contraction of the Muellerian muscles under the influence of the overactive sympathetic nervous system. It often is absent during the early stages of the disease and sometimes throughout its course. It has been described as occurring in certain toxic states such as lead poisoning and accompanies thrombosis of the cavernous sinuses. The peculiar unwinking stare described by Stellwag is due to widening of the palpebral fissure as the result of contraction of the *levator palpebræ superioris*. It is present, more or less well marked, in all cases of exophthalmic goitre but may be found in normal individuals and is common in hysteria. Von Graefe's sign, a delay of the upper lid in following downward movements of the eyeball, and Moebius' sign, a failure in convergence of the eyes when looking at a near object, are present only in about 15 per cent of cases and occasionally are to be found in healthy subjects.

Apart from exophthalmos, goitre and increased basal metabolism, which together are sufficient to establish a diagnosis of exophthalmic goitre, there are other signs almost equally characteristic and as constantly present. These are:—

1. The occurrence of loss of weight in spite of an increased food intake.

2. The presence of a constant feeling of warmth associated with an increased tolerance of cold.

3. Weakness of the quadriceps muscles out of proportion to the degree of general muscular weakness.

4. The presence of a bruit over the superior thyroid arteries.

Wasting associated with an increased food intake is found only in diabetes and exophthalmic goitre and rarely will there be difficulty in differentiating these conditions. Occasionally, however, a patient with exophthalmic goitre shows glycosuria and, more commonly, a diminished carbohydrate tolerance which is not due to an inability to utilize glucose, as in diabetes, but to an abnormally rapid mobilization of glycogen from the liver. In some cases therefore it may require careful study of blood sugar curves, and of the response of the glycosuria to alterations in diet, in order to determine whether the case is one of exophthalmic goitre with glycosuria, diabetes, or a combination of the two diseases. It may happen that the question can only be answered by a determination of the respiratory quotient before and after a glucose meal; a sharp rise to a fairly high level will exclude diabetes.

A constant feeling of warmth persisting over a long period independent of environment and not associated with fever indicates the onset of

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hyperthyroidism. It is due, of course, to the increased metabolic rate and, therefore, may not be well marked in the early stages of the disease.

Some observers attach much diagnostic significance to the development of weakness in the thigh muscles. This can be demonstrated by asking the patient to step onto a low stool or the step of an examining table. Frequently subjects who do not complain of general muscular weakness are unable to accomplish this movement without assistance.

In about 80 per cent of cases of exophthalmic goitre auscultation over the thyroid gland will reveal a loud prolonged brûit with its point of maximal intensity over its superior poles. This is a sign of the utmost diagnostic significance although it may be present in the case of vascular colloid goitres. Murmurs originating in the carotid arteries may be present in normal individuals and are of no significance, they also may be heard at the superior poles of the thyroid but are to be distinguished from the characteristic murmur arising in the superior thyroid arteries by their shortness and by the fact that they are best heard just above the clavicle.

Occasionally it will happen that notwithstanding a most careful examination of the patient and even in spite of a metabolism test, some doubt will remain as to whether the case is one of exophthalmic goitre or some other condition, most usually neurasthenia or an "effort syndrome." Under such circumstances the application of a therapeutic test may settle the question. Symptoms due to exophthalmic goitre will, in the majority of cases, rapidly subside as a result of rest in bed and the administration of Lugol's iodine solution, whereas such measures have little effect upon the manifestations of a neurosis or neuro-circulatory asthenia.

With regard to treatment. While it is generally admitted that in the majority of cases of exophthalmic goitre surgical removal of a portion of the thyroid gland will restore the patient to health more quickly and more certainly than any other measure, the importance of medical treatment in the pre-operative and post-operative periods cannot be exaggerated. In certain of its phases exophthalmic goitre should be considered absolutely inoperable and prolonged medical treatment may be required before thyroidectomy can be performed with a reasonable degree of safety. Severe cases may require weeks of such treatment in conjunction with the skilled application of x-rays or radium preparatory to surgical intervention. Speaking generally it may be said that, in the absence of obvious contraindications, a patient is fit for operation whose basal metabolic rate has fallen below + 40 and is steadily declining; who is showing a steady gain in weight and who no longer displays extreme nervousness and excitability. An operation upon a nervous and excitable patient with a high or rising metabolic rate is likely to be followed by a severe, perhaps fatal, crisis. Auricular fibrillation in the absence of myocardial insufficiency does not contraindicate operation, often it persists throughout the pre-operative period to disappear after thyroidectomy. Usually it is not influenced by digitalis or quinidine and the consensus of opinion seems to be that these drugs should not be employed previous to operation.

Believing that the manifestations of exophthalmic goitre are due to the excessive production of thyroxin, part of which is incompletely iodized, medical treatment is properly directed towards reducing thyroid activity, detoxicating the abnormal thyroid secretion, and the restoration of a condition of good nutrition. Reduction of thyroid activity is aimed at by enforcing bodily and mental rest. This usually is difficult and is not to be attained merely by directing the patient to stay in bed. An attempt must be made to remove all sources of worry and strain and to control the ceaseless activity and excited conversation. Discretion will have to be used with regard to isolation, as the exclusion of desired visitors may serve to aggravate the patient's restlessness. The influence of a clever and sympathetic nurse is valuable in calming the patient but usually will have to be supplemented by the free use of sedatives such as luminal.

The abnormal thyroid product is neutralized by the use of iodine. Plummer's procedure is as follows:

"For the first ten days of treatment 10 minims of Lugol's solution is given three times a day. For patients operated on, this dosage is continued up to operation and throughout the post-operative reaction even though the operation is postponed for several weeks. In cases that have not been controlled by operation and 'recurrent' cases, and all cases in which operation has been indefinitely postponed, the dose is reduced to 10 minims daily in from ten to fourteen days. Following the post-operative reaction 10 minims

daily are given as a routine for eight weeks. If following this there is a recurrence, iodine is given for three months if it completely controls, and is then discontinued. This programme is followed out as long as 'recurrences' occur and are completely controlled by iodine. If they are not controlled a second resection of the thyroid is performed."

Owing to their increased metabolism, patients with exophthalmic goitre require very large quantities of food. Sturgis and Green have calculated that a man with a metabolic rate of + 50 doing a moderate amount of muscular work, requires 6,000 calories daily to maintain his nutrition. Usually in spite of a voracious appetite these patients suffer from a progressive loss in weight while leading an active life. A most important feature in the pre-operative treatment of a case of this kind, therefore, is to furnish a high caloric diet. The patient's favourite foods should be discovered and every effort made to tempt his appetite. Glucose oxidation is very rapid in this disease, and carbohydrates should be given in large amounts in an attempt to maintain the glycogen store of the liver. It is equally important to force the fluid intake. The high metabolic rate leads to increased production of heat and for the dissipation of this by evaporation an increased supply of water is necessary. To avoid dehydration the patient should consume at least 3,000 c.c. of fluid in the twenty-four hours.

The routine medical treatment of a case of exophthalmic goitre, therefore, comprises rest, ensured if necessary by the use of sedatives, the administration of iodine, a high caloric diet and abundant fluids. A word remains to be said with regard to the management of the dreaded crisis or "thyroid storm."

The onset of this condition is sometimes foretold by nausea, vomiting, extreme excitability, increased rapidity of pulse and respirations, a rising temperature and a rising metabolic rate. Often, however, it follows immediately upon operation. Its management requires ice to control the temperature, morphine in large and repeated doses to calm the patient, the persistent administration of fluid by mouth and rectum and glucose solution intravenously. Lugol's solution must be given in large doses, 50-100 minims within a few hours by mouth, by rectum, and intravenously in glucose solution.

POST-OPERATIVE VOMITING TREATED BY GLUCOSE AND INSULIN

By H. S. Dolan, M.D.

From the Department of Surgery, Royal Victoria Hospital, Montreal

VOMITING in a varying degree following operations is a common sequel but happily, severe and uncontrollable vomiting is comparatively rare. One has only to review the literature for the past eight to ten years to find what very various and diverse treatments have been recommended for this condition. The following paper is a short review of an investigation carried out on a series of 15 selected post-operative cases.

There are many gradations between those patients who, following operation, have a slight amount of vomiting and those who have severe vomiting, the general condition and mentality of the patient determine very largely whether this condition is serious or not. In Dr. Archibald's operative chest clinic in the Royal Victoria Hospital in which patients have previously been under treatment in sanatoria for a considerable period of time, and are not of the robust type, but rather the reverse, they are consequently of a more highly-strung temperament than the average patient. In these cases, post-operative vomiting, excessive even in the slightest degree, assumes a more important rôle than does a similar amount of vomiting occurring after a shorter operation such as an appendectomy; because the improvement of the condition of such chest cases depends upon operative procedures which number from two to four stages; and furthermore, extensive operations on the chest wall entail considerable

systemic and local shock, owing to the derangement of the respiratory balance.

It had been noticed in this hospital that, following operations on diabetic patients who had been given a moderately high carbohydrate diet and insulin previous to the operation, vomiting was conspicuous by its relative absence. This although not in accord with the findings of Sise and Herner of Boston, who report no improvement in the post-operative vomiting or acidosis in 30 successive operations treated by insulin before operation. But in their cases insulin alone was given, and the cases were not diabetic; there is therefore no comparison between their clinical study and our observations.

It is generally recognized that in cases of persistent vomiting, acidosis, or sometimes an alkalosis, of the blood occurs, and that acetone and diacetic acid may appear in the urine. Whether this is the cause or result of the vomiting it is difficult to say; but on account of this, and knowing the good result achieved by insulin in diabetic acidosis, it was decided to try what the administration of insulin and glucose in cases of post-operative vomiting with acetone and diacetic in the urine would accomplish.

The first patient was a lady, 68 years of age, who had a history of chronic gall bladder trouble for 15 years. Her general physical condition was good. Her blood sugar on admission was before food 0.099 per cent, and after food 0.238 per cent. Her urine showed no sugar or albumin. She was operated upon on April 20th, under ether anæsthesia, and a cholecystectomy with drainage of the common duct was done. Following the operation she was given per rectum 12 ounces of normal saline with 10 per cent of glucose, and this was retained, but shortly afterwards she began to vomit, and this continued in spite of ordinary treatment. On the second day her stomach was washed out, the return flow being slightly coloured. Notwithstanding vomiting persisted and on the third day her urine showed acetone and diacetic acid in fairly large amounts. Her temperature was 100,° pulse 128. She was now given 500 c.c. of 10 per cent solution glucose intravenously with 10 units of insulin hypodermically, and in 12 hours her vomiting had ceased and the pulse had fallen to 108. There was still a trace of acetone in the urine. Her return to ordinary diet was slow, but her recovery was straightforward. She was discharged 20 days after operation with wound healed.

The second patient was likewise one on whom a cholecystectomy was done. She was a lady 63 years of age in good physical condition. Her complaints dated back for many years, and she always had been subject to bilious attacks, occurring about once a month with some nausea and vomiting. Blood examination showed 4,600,000 red cells, 6,400 white cells, hæmoglobin 70 per cent. Her blood sugar and blood chemistry values were normal. She was given by rectum, 8 ounces of normal saline with 10 per cent of glucose and 5 per cent of sodium bicarbonate, the evening previous to operation. She began to vomit soon after operation and this persisted for 3 days in spite of repeated gastric lavage and an intravenous injection of 500 c.c. of 5 per cent glucose, given on the evening of the third day. The morning of the fourth day her condition was only fair, and she seemed quite dehydrated. Her urine showed both acetone and diacetic acid. Her temperature was 99,° with a pulse of 110. She was given 500 c.c. of 10 per cent glucose and 10 units of insulin. Her vomiting ceased that day, although she felt nauseated and her return to ordinary diet was slow at first. The acetone persisted for 36 hours. Her recovery was good.

The next case was a lady, 73 years of age, who after a radical amputation of the breast for carcinoma, began vomiting to an alarming degree. The second day after operation the vomiting was almost incessant, and of a dark yellowish colour. Her stomach was washed out with some relief, and an intravenous injection of 300 c.c. of 20 per cent of glucose, but no insulin, was given. Her blood sugar was not taken, but previous to operation her urinary findings were negative. At this stage her CO_2 plasma capacity was 50.7 volumes per cent, there was a slight decrease in her blood chlorides, and acetone was found in her urine. She could not retain the rectal salines. She was then given 350 c.c. of 20 per cent glucose with 15 units of insulin, and while she vomited small amounts on two occasions, two to four hours

after giving the insulin her general condition improved and her recovery seemed good. She suddenly died on the sixth day after operation. The post mortem examination disclosed no lesion in abdomen or chest except some fatty metamorphosis of the heart, and as we had no permission for examination of the head, we could not accurately determine the cause of death. However, it was judged to be cerebral, probably an embolus, on account of the suddenness of the symptoms.

The next case is one of special interest because we have in it a comparison, as it were, on the same patient. It was decided because of the seemingly good results obtained in these three cases and in others in which the results were not so striking, to try a preventive scheme. Suggestions for details of the scheme, the procedure and observations of its working, were under the care of the Department of Metabolism. One-half hour before anæsthesia, blood was taken and 100 c.c. of orange juice was given by mouth, with 5 units of insulin hypodermically. Three hours after operation 100 c.c. of 20 per cent glucose was given hypodermically, and at the same time blood and urine were taken for examination.

The first case was a young man of 34 years of age, who had had unilateral pulmonary tuberculosis for three years previous, and on whom it was judged a thoracoplasty was indicated. His general condition was only fair. At the time this procedure was to be tried out, a first stage thoracoplasty had already been done. Following this the patient had severe vomiting and his pulse was quite irregular, going as high as 120. Before doing the second stage he received 100 c.c. of orange juice by mouth and 5 units of insulin. His blood sugar was 0.105 per cent. Urine was negative to diacetic and acetone. Three hours after operation his blood sugar value was 0.291 per cent and 6 hours after operation, 0.150 per cent. The urine showed no acidosis. His recovery was uneventful with no vomiting, but some nausea. The patient himself was quite pleased by the contrast in his post-operative recovery.

This procedure was carried out in a short series of cases with what we considered good results. The vomiting was less, but nausea persisted. Of course to have a control is difficult, and the interpretation of results is of a personal nature.

Those workers who follow to the letter instructions set down, have always been the back bone of medicinal generalization and tabulation, but those who doubt and break down the conventional barriers, may be a definite aid in discovery. The following case conveys what I am attempting to show: a lady, aged 30, with chronic pulmonary tuberculosis, was admitted on February 12, 1926, with a history of expectoration and cough dating back 6 years. She had spent the last 3 years in a sanatorium, 2 years of this time as a bed patient. Her sputum averaged 65-150 c.c. daily. A phrenicotomy was done under gas and oxygen anæsthesia on February 17th. A somewhat stormy convalescence followed with considerable vomiting. Because of this, the preventive treatment outlined above was carried out before her second operation—a first stage thoracoplasty with removal of parts of 7 ribs. Her convalescence was good. There was some nausea but no vomiting. In 20 days a second stage thoracoplasty was done with partial removal of 5 ribs. It was decided by the resident in charge to omit the anti-vomiting treatment to test its efficacy because there had been supposedly a nervous element in the first operation (a phrenicotomy). She vomited considerably for 3 days and a trace of acetone appeared in her urine. The condition was controlled by an intravenous injection of glucose, 100 c.c. of 20 per cent, and 10 units of insulin.

With our modern treatment of the preoperative stage of operation in which the patients are given fluids and glucose, severe post-operative vomiting has become quite rare; a few years ago, when patients were purged and went to operation dehydrated, vomiting was a common sequel. In those cases in which an acidosis develops, it is generally admitted that this depends upon the improper and insufficient oxidation of carbohydrates which causes an incomplete oxidation of fats. Fats, it has been graphically stated, burn in the fire of carbohydrates. When this oxidation is incomplete, acetone, diacetic and oxybutyric acids are formed. Whether the acidosis appears first and causes the vomiting, or the acidosis is in the nature of a starvation acidosis due to vomiting, it is difficult to say. In any event, a vicious

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circle is established which may be broken by giving glucose and insulin to oxidize the glucose. Thus the fats and incompletely oxidized end products are burned up, and the acidosis is lessened. A short review of the literature on the subject shows that equally good results have been obtained by several workers, principally by Thalhimer at Columbia Hospital, Milwaukee, who reports 4 cases with definite improvement of symptoms. Pernicious vomiting in pregnancy and acetone vomiting in children have been treated with equally good results by many workers, and the literature contains many references. This subject is beyond the scope of this paper.

We have also treated vomiting occurring in general peritonitis with some striking results, and on one particular occasion, it marked the turning-point in the convalescence of an otherwise hopeless case. In all cases of severe post-operative vomiting a careful study should be made by blood chemistry. In cases in which the blood chlorides are low, the improvement which follows the intravenous injection of chlorides is very striking, and this improvement is seen to go hand-in-hand with the rising blood chloride values. I only add this to show that post-operative vomiting cannot be always ascribed to one special cause; no one treatment is applicable to all cases.

In conclusion, it may be said that glucose and insulin have a decidedly beneficial result on severe post-operative vomiting when it has once become established, and that, in those cases where lesser degrees of vomiting are both distressing and dangerous to the general state of a not too robust patient, it has, under our observation, a decided prophylactic value

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WOUND INFECTION IN APPENDICITIS

By L. H. McKim, M.D.
Montreal

A PREVIOUS study[1] of all cases of acute appendicitis operated on in the "L" service of the Montreal General Hospital,* for a period of 2 years ending June 30, 1920, revealed certain interesting points which, insofar as they concern this paper, may be summarized as follows:

	Non-Perforated	*Perforated*
Average number of days in hospital	13	33
Mortality	0	16.9 per cent
Wound infection	1	95 "
Incidence	56 per cent	44 "

It may be mentioned that the above average of days in hospital did not include four cases of fæcal fistula, each of which were in hospital over one hundred days. The striking features were, of course, the number of days in hospital and the somewhat alarming mortality following perforation.

Ever since this investigation our efforts have been directed towards the reduction, both in incidence and severity, of the wound infection which was known to be the chief cause of the prolonged hospitalization, and which undoubtedly played a part in the high mortality. A report of the measure of success which has attended these efforts is the excuse for the publication of this paper.

During the first year or so, our technique was not standardized. Various measures were tried. The use of waterproof pads to protect the wound edges was attempted but was soon discontinued. The next step was the use of various solutions to protect the wound or to cleanse it after soiling; eusol, Dakin's solution, acriflavine, sterile liquid paraffin and other solutions were made use of, but the results attained did not impress the group of surgeons, as a whole, sufficiently to warrant the adoption of any one of them as a routine. Finally, however, the use of bipp as a wound protective, as suggested by Dr. F. B. Gurd,[2] has come to be adopted as a routine procedure in every case suspected of perforation. The technique may be briefly summarized as dehydration of the wound with alcohol and thorough treatment of its entire surface with "bipp" immediately before opening the peritoneum. Certain

* Dr. E. M. Eberts, and associates.

minor differences of technique exist. Some of the operators do not dehydrate previous to rubbing in the "bipp." In the opinion of the author, however, this step is of importance inasmuch as following the use of alcohol, the "bipp" tends to adhere more readily to the tissues. Another minor point is the consistency of the "bipp" used, the addition of a certain amount of liquid paraffin to give a more fluid mixture being preferred by some members of the staff. The muscle splitting incision (McBurney or transverse) has been used as a routine unless there has been serious reason to question the pre-operative diagnosis.

An analysis of 219 acute cases, with 7 deaths operated on during the years 1923–24 and 25 shows the following results: (See Table below.)

The points of difference apparent on comparing these results with the previous series are in connection with the perforated cases.

1. Reduction of average number of days in hospital from 33 to 25.

2. Reduction in mortality from 16.9 to 8.2 per cent.

Only those cases in which immediate operation was performed, are included in this series. As *all* complicated cases are considered in the present analysis, and, as already stated, four cases of fæcal fistula each of over one hundred days hospitalization, were omitted from the previous series, the difference in hospital days is really considerably more than that given. Of the seven deaths reported, two died the day of admission, only a few hours after operation. One of these was an infant two years old. The second was an adult who had as associated conditions endocarditis, nephritis and diabetes. Neither of these cases is considered in the calculation of average of days in hospital as their inclusion would give a false average. One case died on the 78th day from acute pulmonary tuberculosis, apparently the activation of an old lesion. Sh also had a chronic salpingitis, probably tuberculous.

The mortality of 3.1 per cent of the total acute cases and 8.2 per cent of the perforated cases compares favourably with many recently published figures, as the following table shows:

Percentage mortality in all acute cases	*Percentage mortality in perforated cases only*
3.1	8.2 Montreal General Hospital
4.2	— Warmshius[3]
7.2	— Gatch and Durman[4]
5.9	— Deaver and Magoun[5]
8 0	— Lincoln[6]
1.5	2.78 Archer and Young[7]
5.8	8.9 London Hospital[8]
8.4	13.2 St. Thomas Hospital[8]

It will be observed that only one (Archer and Young) of the above reports shows a lower mortality than that reported in our analysis. The figures in this report are based on a series of 133 acute cases only. They also include one death in an interval case.

The figures in regard to wound infection in our series are deceptive, as they are really higher than clinically was considered to be the case. To avoid confusion, all cases have been classified as "infected" where there has been the slightest leakage from the wound. The use of any preparation of "bipp" of course, delays the healing to a certain extent, and frequently results in a slight greyish discharge from the wound. This discharge is a mixture of "bipp" and serum from the wound and is practically always sterile. Unfortunately, however, for purpose of statistics, a culture was not always taken, hence the classification as "infected." As a proof of this it may be noted that the apparent high percentage of wound infection in the non-perforated cases has not interfered with the average of days in hospital to any marked extent. Many of these were "bipped" when the possibility of perforation was suspected.

		Perforated			Mortality Percentage			Days in Hospital		Wound Infection Percentage	
Year	*Cases*	*Number*	*Percentage*	*Died*	*Perforated*	*Non-perforated*	*Total*	*Perforated*	*Non-perforated*	*Perforated*	*Non-perforated*
1923.....	68	27	39.9	1	3.7	0	1.4	26.5	12.2	5.7	7.3
1924.....	81	29	35.7	4	13.8	0	4.9	27.1	13.4	93.1	7.6
1925.....	70	31	44.2	2	6.4	0	2.8	22.1	14.7	64.0	10.2
Total....	219	87	38.9	7	8.2	0	3.1	25.1	13.5	71.0	8.0
1919–20.....			44.0	..	16.9	0		33	13	95.0	1.0

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Another factor affecting the same figures is the occurrence of an unusually high percentage of gangrenous cases. This type of lesion seems to tend towards wound infection even before perforation occurs. Of the 11 cases of wound infection in non-perforated cases it is worth while observing that 8 occurred in the gangrenous and only 3 in the ulcerative type.

A final consideration from the standpoint of hospital efficiency may be made. The saving of 8 days per average perforated case as here shown represents a total saving of 696 hospital bed days for the 87 perforated cases in the series, or the provision of bed accommodation for 53 additional patients based on the hospitalization time of the non-perforated case (13.5 days).

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ENCEPHALITIS LETHARGICA

INFLUENZA ENCEPHALITIS

BY W. D. PATTON, M.D., C.M.

Vancouver, B.C.

THE object of this short paper is to set forth certain ideas as to the possible cause of so-called epidemic encephalitis, the classification of types and more particularly the treatment of the disease by acriflavine.

If all cases of encephalitis were lethargic the term first given to the malady by von Economo in 1917 would be ideal, but since other types than the lethargic are common, the term "influenza encephalitis" is suggested, restricting the use of the word "lethargic" to the first type, giving the name "myoclonic" to the second and "maniacal" to the third type.

Etiology.—Da Fano in *Ministry of Health (England) Report No. 11 Encephalitis Lethargica,* tentatively puts forward the suggestion that the findings in this disease may be due to the presence in the tissues of a living agent, analogous to the Negri bodies in rabies. *Can it be that the disease is a septicæmia or bacteræmia due to the influenza organism?* The malady follows so closely on some form of influenza infection that it would seem as if the causative agent were the same in both diseases. Four cases of encephalitis neonatorum mentioned in the Ministry of Health Report can be readily explained on such a basis. The widespread infection of influenza, and the comparatively few instances of encephalitis may be compared to the incidence of ordinary infections and septicæmia. Believing this malady to be a septicæmia, an effective treatment by intravenous therapy was considered a possibility and first given by me in June, 1924.

Histopathology.—Post mortem reports seem more or less in agreement upon the finding of hæmorrhagic areas in the brain, more minutely described as a cellular infiltration of perivascular lymphatic sheaths of certain areas of grey matter, the cells concerned being the small mononuclear leucocytes, polymorphonuclears being noticeably absent. These foci are described as occurring in various parts of the brain substance. This affords a reasonable explanation of the extreme variation in symptoms, an enumeration of which is impossible in this short paper, but a brief review of the symptoms most common in each of the three types may not be out of place here.

In the first, or lethargic type, diplopia is frequent, together with other involvement of the cranial nerves and lethargy in varying degrees. In the second type delirium is often an early symptom with more or less intense neuralgic pain in different parts of the body, without local manifestation. Myoclonia is

usually preceded by pain of a severe character in the muscles which later will show rhythmic contraction. In one case under observation neuralgia was present ten days before the onset of myoclonia of the muscles of the abdominal wall. In the third, or maniacal type, the symptoms found in the myoclonic type may also be present, although the patient does not complain of neuralgia but only of intense headache with disturbing dreams, and may later lapse into a state where restraint becomes necessary. In this third type insomnia is a distressing symptom thus sharply differentiating it from the first, or lethargic type of the disease. In many cases all the symptoms mentioned above are present to an unusual degree of severity; in others any or all of these symptoms may be present in a very mild form.

Diagnosis.—The diagnosis is sometimes easily made, at others it can only be arrived at by a process of elimination. In the Ministry of Health Report a method of differentiation from meningitis is given by examination of the spinal fluid. The report points out also that the results of such examination made during the first two weeks will vary from similar examinations made later. The fluid is always clear, it will usually show an increase in cells, always below 100 in number and always 100 per cent lymphocytes. (Under histopathology it is noted that the cellular infiltration is always lymphocytic).

Summary of cases.—The ten cases treated by me may be classified as follows:

Lethargic type	1
Myoclonic type	4
Maniacal type	5

The earliest case occurred in May, 1920, and is the only one that did not recover. Patient was a male of 68 years with severe neuralgia and myoclonia, who developed a hypostatic pneumonia which rapidly proved fatal. Age incidence in the other nine cases varied from 25 to 65. No two cases occurred in the same home. All the patients have been followed up as far as possible in regard to either complete recovery or the development of sequelæ. One, a Chinaman, who had myoclonic symptoms and in whom foot-drop developed, was sent back to his home in China owing to his inability to work. An interesting point in his case was hæmorrhage from the left ear coming on subsequent to the myoclonia. This was seen by a specialist who stated that it was a typical hæmorrhagic otitis media with perforation of the tympanum as seen frequently in influenzal conditions.

So far paralysis agitans has not developed in a single case, but the saying that "any patient quite ill never fully recovers" possibly applies more to encephalitis than to other diseases. My experience has shown me that in patients who have apparently completely recovered, any emotional upset, such as anger, excitement, or merely an extra amount of work, will induce a condition of fatigue or even collapse, out of all proportion to the cause.

Treatment.—Brain or nerve tissue when damaged requires a long time to recover. Absolute rest and quiet are essential. Patients should remain in bed for at least six weeks, or longer if the attack has been a severe one. In my opinion *any* case of encephalitis is serious, as a mild form of the disease may later develop an incurable sequela in paralysis agitans. The neuralgia must be treated by suitable drugs and the insomnia will require the use of narcotics for a considerable time.

Feeding is important, and excepting at the times when lethargic or maniacal symptoms are present, patients will usually take food well, and in many cases put on flesh even while kept in bed.

Believing the disease to be a septicæmia, I thought it wise to try intravenous dye-therapy. As I consider acriflavine to be possibly our most valuable antiseptic I gave this to my last two cases. The results were so prompt and so apparent that I give the details in the hope that others may confirm or refute its merits.

The first patient to whom I gave acriflavine was a female having the maniacal type of the disease. I began with 10 c.c. of 0.5 per cent solution of neutral acriflavine in normal saline. The first dose was given on June 17, 1924. Increasing doses were administered daily until 25 c.c. were given. The patient became quite clear mentally after the fourth dose, and made an uneventful recovery. The next patient was also of the maniacal type and had to be kept in restraint. After the fourth dose the restraint was removed and again uninterrupted recovery

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followed. Six doses in all were given each patient.

Three other cases treated by my confrères have resulted in equally satisfactory results. All were given acriflavine during the acute stage. One doctor remarked to me, that the dye acted like a specific, the result was so prompt and so apparent. The first lethargic case to be given acriflavine was a child of ten years seen in consultation, that could not be roused sufficiently to take food. Patient lost all lethargic symptoms after four doses were given and made a good recovery. A recent case, a doctor's wife, also with the lethargic type of the malady was given 30 c.c. doses of 0.5 per cent neutral acriflavine and showed improvement after the first dose. Four doses brought about a normal state of mentality. No reactions or untoward results have so far been observed from the intravenous use of this drug.

With regard to the acriflavine used.* During some experimental work in 1922 and 1923 I noticed that some preparations of acriflavine on the market were acid in reaction and that others were lacking in bactericidal properties.

The use of neutral acriflavine being more or less in the experimental stage the correct dosage can only be arrived at by experience. It is possible that stronger solutions or larger doses might be efficacious, or that the doses might be repeated at shorter intervals than 24 hours, as they have been given by us. It must always be freshly prepared, dissolved in normal saline solution, boiled and cooled to body temperature and given preferably by syringe with a fine needle and injected slowly. Any of the solution escaping into the tissues will prove irritating, but this effect soon passes.

* For intravenous therapy the neutral acriflavine especially prepared for this purpose by the National Aniline Dye Company has been found satisfactory.

SOME PROBLEMS OF CHILDHOOD

By W. M. Musgrove, M.D.

Physician in Charge of Out-Patients, Psychopathic Hospital, Winnipeg

"WHEN we consider that man is lord of creation and that the child, who is the man of to-morrow, is the most important of all things that live and grow, it is amazing how little attention we pay to the normal traits and developing habits of childhood."[1] There is however, at present, a rapidly growing interest in child health and in child welfare generally. A quarter of a century ago there were not half a dozen children's specialists in the country, no medical school had a department of pædiatrics, no laboratory was equipped for the investigation of pædiatric problems other than diphtheria. There were no milk depots, no baby health centres, no provincial or municipal departments of child welfare and no public health nurses. These have all grown up as a result of a growing consciousness that the conservation of human material is at least as necessary to civilization as the development and preservation of our natural resources. In the investigation and study of the life histories of those unfortunates who have broken down under the strain in the game of life, we are repeatedly impressed by the fact that the roots of many mental disorders of serious consequence are to be found in the childhood of these individuals.

Attention to the physical defects of our growing populace is a most commendable activity, but the old dictum "a sound mind in a healthy body" is only partially true. The direction of the human mind and of the human personality cannot be adequately achieved through attention to man's physical well-being alone. We are convinced that the destiny of the individual is determined very largely by the experiences that come to him during the very early years of life, and it is our faith in the correctness of this principle that underlies the widespread belief among psychiatrists that the most substantial promise for the alleviation of at least some of the misery, unhappiness and failure of adult life, lies in a more intelligent management of the period of childhood.

There exists a curious feeling of helplessness and frequently hopelessness among lay people about anything that pertains to mental abnormality, and in most communities there exists also a degree of "psychophobia" which prevents the application of much that we might like to do in the way of understanding and attempting to deal with the problems of childhood. All this, of course, is to be expected as it has grown out of the feeling that it is something highly disgraceful to have anyone in the family who shows abnormality of any kind in his behaviour. Many people we find seem almost proud of a physical disorder of some kind, it is something concrete, something one can talk about over the back fence, but when we come to the more abstract, namely an illness of behaviour, it is felt to be something to be hidden away with the family skeleton. Such occurrences are regarded as the out-cropping of bad heredity. "Johnny is just naturally a bad boy. He has inherited all the bad traits of his uncle or some other member of the family." Now why should he? It is just as logical to suppose that he has acquired these characteristics, because he seeks to emulate this uncle, whom he secretly admires, as to suppose that these traits have been handed down to him through the medium of some specific determiner in the germ plasm.

Only recently we have seen a boy who was emotionally a miniature picture of his unstable mother. He was referred to the psychopathic out-patient department because he had not been making good progress in school and had told the school nurse that he would go crazy if forced to attend. The mother spent most of the time with us in talking about her own aches and pains, which were numerous. The most troublesome seemed to be a neuralgia on the left side of the face. The boy, with a perfectly sound set of teeth, volunteered the same complaint, using precisely the same words to describe it. This little fellow, according to intelligence tests, was found to be quite normal, but it was apparent that he was anything but normal in the emotional sphere. We are certain that if this boy is allowed to continue to live in this atmosphere of emotional tension, the outlook for satisfactory adult adjustment is pretty hopeless. In this case I think one is quite justified in saying that, implanted in this boy's personality, are the roots of mental disease. Is it reasonable to suppose that he has inherited these characteristics? I think not. Transferring him to a mentally healthy home would prove in a fairly short time that the influence of environment here is much greater than the influence of heredity.

There is one well recognized type of personality to which I would like to call some attention, namely, the "shut-in" or introverted type. We consider it very often to be a danger signal, a warning that there are breakers ahead in the mental lives of individuals possessing it in a marked degree. This type of reaction is readily recognized in childhood, and growing experience convinces us that a great deal can be done to modify it during the formative years. In so doing we might hope to avert much trouble for the individual later on.

The child with a "shut in" type of personality is usually quiet and seclusive. He does not take much interest in the normal play activities of childhood and his happiness does not seem to depend on contact with other children. He is set apart, outside the herd. His inner mental life becomes adequate to him. In other words, the "land of make believe" for him becomes more pleasant than the realities of existence. He is turned in on himself, introverted, a dreamer. It is only in the matter of degree, of course, that this type of mental reaction is to be considered as dangerous. It is the more or less normal behaviour of individuals whose situation becomes such that the actualities of life are inadequate to their emotional needs. We realize, of course, that much of the beautiful in art, many great inventions and even social reforms are the result of someone's journey into the "land of make believe." These people have learned the necessity of harnessing their day dreams to the practical things of real life. Productive day dreaming, that tries to link hopes with accomplishments, is responsible for the advancement made in every walk of life. It is the sterile type of day dreaming that substitutes wishing for doing that is harmful, and it is this kind of mental activity we so frequently see in individuals who are suffering from a type of mental disorder that accounts for something like 60 per cent of our institutional population. So this land of dreams, even though it may be a delightful place to spend a quiet hour oc-

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casionally, is a mentally unhealthy place in which to live all the time.

So far we have indulged more or less in generalizations regarding mental hygiene and its relation to the problems of childhood. In a short paper it is impossible to discuss the problem child at any great length. It cannot be too frequently emphasized that every problem case is an individual one, and that we cannot generalize as to the cause of the difficulties, but must work out the etiology anew in each instance. In brief, a problem child, too often, is one whose training has been neglected until he has reached a point, where his behaviour becomes such as to interfere with the activities of his elders.

At this point I should like to call attention to some of the normal traits of childhood which can be moulded, by good habit formation, into a *tout ensemble* which will make for something approaching good adult adjustment to the problems of life.

In the first place, the child is imitative. For his habit pattern he depends very largely on imitation. When the baby begins to talk, it imitates what it hears, and what it does is, to a very great extent, an imitation of what it sees being done by those about it. Naturally the child imitates bad examples just as readily as good, hence deception, selfishness, bad temper, cruelty and the like should not be displayed by those who have children under their care.

The child is suggestible. This means that all kinds of unhealthy thoughts and unnatural behaviour may be suggested by unwise words and actions. The "nervous" mother often projects to the child her own symptoms by constantly harping on her troubles in the child's presence. Troubles are the heritage of the race but there is no reason why one should handicap the coming generation by constantly painting gloomy pictures of the future.

All normal children are curious. It is fortunate for civilization that they are. Curiosity might almost be described as the child's instinctive craving for the accumulation of knowledge. The ancient quip about the father, who loses patience at the numerous questions of his small son has its serious side. The child is simply trying to satisfy that craving for knowledge, which is as necessary to him as water, air and sunshine are to the growing plant. Most children are more curious about matters of sex than anything else. This may be because they soon become aware of the fact that this subject is taboo, and naturally their curiosity becomes the stronger. We believe that as soon as children are old enough to commence school, they are old enough to have simple questions answered in a straightforward manner. If they do not obtain satisfactory information from the proper source, they will get harmful misinformation, which in many cases gives them a distorted outlook regarding human relationships. Any who may be particularly interested in this problem are referred to an excellent book by a lay woman, Mary Ware Dennett.*

Children love power. They like to be in the spot light. This is not strange since in early infancy they are able to control their surroundings to a very great extent. Everyone tries to anticipate the needs of the baby, particularly the first one. However, there comes a time when the child can no longer have its own way, a time when it must begin to conform to the wishes and recognize the rights of others. Many a so-called "spoiled child" is simply reacting according to this infantile pattern, because it has never been taught to realize that the world no longer revolves around it alone. The youngster who frequently refuses to eat in order to create a commotion in the family circle, will often do so very quickly if he is totally ignored.

Many children pass through a phase of savagery which is only a stage in their normal development. There comes a time when they want to run away from home to ride bronchos and kill wild Indians. During this phase, cruelty to animals may be manifest. There are, however, many healthy substitutes for killing Indians — Boy Scouts, outdoor life, summer camps, school athletic activities, all provide an outlet for savage instincts and at the same time build up physical strength to face the difficulties of later years.

A vivid imagination is a more or less normal trait of the growing child. This is often associated with the telling of tall stories, a habit which may lead to more serious prevarication later on. The tendency to exaggerate so often met with in

* "The Sex Side of Life," Mary Ware Dennett, 350 West 55th Street, New York.

adults is a hang-over from this sort of thing. This propensity, we believe, is to be met by acquaintance with good literature. We cannot stress too much the importance of reading, and the type of material the child is permitted to read. Fairy tales have their place, but they need to be intermixed with stories that are founded on facts. The essential thing is to see that the intellectual diet is well balanced. In this way the distinction between truth and fiction is most easily made and at the same time the imagination will be developed along constructive lines.

There is much difference of opinion concerning the nature of punishment that should be administered to children, but we agree to a certain extent with the old proverb "spare the rod and spoil the child." It is quite true that there are certain types of hypersensitive, delicate, nervous children who should not be subjected to physical correction. It is equally true that corporal punishment is often helpful. There is one general rule, however, that should be adhered to, and that is, never to postpone the correction; it should be directly associated with the offence. If the child comes to realize that certain types of conduct invariably result in pain or discomfort of some kind, he will very soon learn to avoid that particular type of behaviour. Punishment that is merely an expression of anger on the part of the adult, creates only anger and rebellion in the child. The adult who loses his self-control in such a situation is behaving worse than the child and the latter knows it. Punishment of this kind is liable to give rise to such a hatred of authority that the boy becomes Bolshevistic in his attitude toward organized society.

The specific social problem with which we are faced in the Province of Manitoba is that of dealing more adequately with the feeble minded situation. We have on our files at the Psychopathic Hospital the records of over five hundred mental defectives. These children, for their own sake and for the sake of society at large, should be receiving the advantages of training in un-graded classes or in a special institution, depending on the degree of defect.

Mental deficiency is a vital community problem which has a very important bearing on the future welfare of the race. It is a problem with many aspects—social, medical, industrial and economic. It is a problem which must be studied both from the standpoint of the individual and the group. The common belief that all the feeble minded are potential criminals, moral degenerates and utterly incapable of self support is anything but true. Many of them are industrious, useful citizens, plodding away at monotonous occupations which the more intelligent man might not do half so well.

One frequently hears the statement that all feeble minded persons should be segregated. This is utterly impossible and equally impractical. Surgical sterilization is also suggested, usually by those who see the problem only from one angle. The fact of germ plasm transmission of defects cannot be minimized, but there are many causes of mental deficiency that are not hereditary. On the other hand we do not know but what a sterilized defective might be even more of a social problem than an unsterilized one. In the case of the female we could expect a greater tendency to the adoption of a life of prostitution with a resulting increase in the spread of venereal disease.

The variance of opinion on the whole subject is a strong argument for the adoption of a practical programme for dealing with the feeble minded. The following, originally suggested by Fernald and since endorsed with minor modifications by other authorities, seems the most adequate method:

1. *Identification,* by means of routine mental examinations of school children three or more years retarded in their school grades.

2. *Registration,* at some central bureau for purposes of ascertaining the extent of the problem.

3. *Education,* in special classes in the public schools of communities large enough and with a sufficient problem to warrant it.

4. *Training,* in simple trades or domestic duties during institutional residence.

5. *Segregation,* only for the lower, helpless group and for defective delinquents who are a menace to the community in which they live.

We cannot expect any radical change in the way in which this problem is being met at the present time but we do look forward to a time when the situation here will be as adequately dealt with as it is in many places elsewhere.

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1. STRECKER, EDWARD A., Mental hygiene and childhood, *Mental Hygiene Bulletin,* June, 1924.

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NUTRITION AND SO-CALLED INDIGESTION*

By John A. Macgregor, M.D.

London, Ont.

CONSIDERING the fact that gastric symptoms feature such apparently widely different conditions as uræmia, cardiac disease, cerebral tumour, intestinal obstruction, appendicitis, gall bladder affections, pregnancy, endocrine disturbances, particularly those of the thyroid and adrenals, some of the psychoses, etc., one must be convinced that the stomach stands sentry for a great variety of problems both within and without the abdomen, aside from those owning a primary origin in this viscus. The field of a physician's investigation should therefore extend to the conditions above instanced in all cases in which distress in some form in the upper abdomen with or without relation to the taking of food brings the patient to the physician for his "stomach." The terms "indigestion" and "dyspepsia" as signifying disturbance of gastric function which seldom exists may well be eliminated from our nomenclature; an elimination which would appear to be justified by the fact that they are not referred to in many of the representative works on diseases of the stomach. In their place I would suggest the substitution of the words "distress" or "discomfort" in relation to the taking of food, as inquiry with reference to these conditions offers the patient an even better opportunity to give expression to his disturbed sensations, in many of these there will be found a more or less readily observed association with organic disease elsewhere; while a large group are the expression of some general disorder of health, of which debility or a neurosis of some type is possibly the more potent factor in the causation.

The sensations normal to the stomach are two: a sense of hunger and a sense of satiety but perversions are frequent and we find sensations of heaviness, fullness, burning, sinking, dull or aching pain, fluttering and nausea as well as many of which the patient fails to furnish a very clear picture for his indescribably indefinite discomfort.

The early phase of cancer and some cases of ulcer furnish a number of patients in whom a definite diagnosis may be very difficult; in fact may be quite impossible without exploration or a necropsy. Excluding these organic diseases and those in which the relation to extraneous disease is obvious, we still have left many cases daily seen in our consulting rooms in whom malnutrition, the product of various agencies, invokes so frequently a vicious circle into which may be introduced at any point psychic attitudes and emotional states which will vary the individual picture and increase our difficulties in bringing about the ultimate relief. These patients almost without exception convict, in their own minds, the stomach as the cause of all their trouble, when as a matter of fact they almost invariably get the cart before the horse and fail to realize that relief of their stomach symptoms will depend on improvement in their general health.

Too many people habitually eat too little. They fail to recognize that the maintenance of health is a business, that it depends on a nice balance between intake and output. They do not appreciate the necessity of providing fuel for the production of energy required for the proper performance of their functions, their physical requirements and above all for their mental demands, which are almost always abnormally great owing to the amount of energy wasted in useless thought and depressing emotion.

An erroneous conception of appetite is a very frequent factor in the promotion of their trouble. They fail to recognize the element of quantity and because they enjoy what little they eat, they interpret this as a good appetite. Many individuals, too, have a fallacious idea of the object in eating. Asked as to why they eat, they will reply, "Why to live, of course." As a matter of fact most people eat in response to a

* Read before the Stated Meeting, Academy of Medicine, Toronto, December 7, 1926.

sense of hunger or cater to the whims of their palate or a capricious stomach, overlooking entirely the promotion of an efficient existence as the real motive in eating.

The necessity of haste with many whose midnight hours or sense of exhaustion keeps them in bed late, is adduced as vindication for the adoption of some of the "hand me downs," such as grape nuts, corn flakes and shredded wheat. The "health hints" in many of our dailies, magazines and health journals edited for the sake of notoriety, usually by individuals grossly ignorant of the principles of physiology or nutrition, contain much pernicious advice with reference to reduction of diet as a preventive of arterio-sclerosis and Bright's disease, conditions which owe no etiologic relationship to diet and whose subsequent progress is little influenced by dieting excepting in some cases the possible necessity of a limitation of the proteins. Often increasing interference with rest dependent on added worry and mental agitation about their condition adds further support to the impetus towards lowered health, and the discomforting sensations in the stomach loom larger and larger on the patient's mental horizon and are gradually read into his vicious circle.

Here the advice of friends, just as likely the blacksmith, always ready to give advice with an assurance in keeping with their ignorance, leads to further curtailment of the gradually diminishing diet by suggesting the omission of foods reputed to be "bad for the stomach." Here we may state that in no phase of the food problem is readjustment of ideas more necessary than in the case of so-called "indigestible foods." Impalpability is the test which forms the basis of judgment with most of these individuals and their diet is constructed from this view point. The inclusion of the cellulose of plants and the fibrous structure of animal foods is a necessity in the maintenance of a healthy digestive tract producing as they do a bulk which gives the intestine better opportunity of handling the content and furnishing a stimulus to movement and secretion. They provide also, in great part, salts and vitamins so requisite to health.

Consultation with the physician sooner or later not infrequently leads to a similar or further suggestion of reduction in the diet. This appeals to the patient, whose lack of appetite indicates that the "system" does not require and should not be given food under these conditions, and whose distress after eating is significant that undoubtedly something is wrong with the stomach. With the patient almost invariably, and with many an adviser, there is a failure to recognize that pleasure in eating is like pleasure in working, the expression of good health and not an avenue back to it.

Many of the distressing symptoms experienced in the stomach have an analogy in the paræsthesias found in the skin, such as stinging, burning, etc. Burning sensations in the epigastrium or behind the sternum along the œsophagus are common and are usually attributed to a hyperacidity when only a gastric hyperæsthesia may exist and the acid content may be well within the normal range. Even hypoacidity or anacidity may be found as the result of the examination of a test meal, which is the only method of accurately ascertaining the condition of the gastric contents. Clinically, in hyperacidity, the tongue is usually clean, may be red and shows good tonus as indicated by the lack of indentation from the teeth, while in hypoacidity the tongue is usually pale and coated and the lack of tonus is evidenced by the markings of the teeth. In case one cannot, for some good reason, obtain an examination of the contents, these features may assist to some extent in arriving at a fairly accurate working conclusion.

The sense of fullness and heaviness, with which hyposecretion is not uncommonly associated is usually accompanied by the belching of gas. This is interpreted generally as coming from the stomach and as evidence of fermentative changes in the food content. The fullness is a vagary or sensation, not infrequently observed even in the case of an empty stomach or on the ingestion of but small amounts of food, while the belching is the immediate sequel of ærophagy, a bad habit in which air is voluntarily swallowed and regurgitated by the œsophagus, before entry into the stomach. The readiness with which the sense of fullness is produced depends on the degree of tonicity in the muscle of the stomach and appears more readily in patients with poor tonicity, a condition which may be surmised by the observation of the above mentioned indentations of the tongue produced by contact with the teeth.

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Flatulence, the result of fermentative changes, is an associate of retention and subacidity most often associated with pyloric obstruction. Occasionally some of the air swallowers acquire the ability to gulp air directly into their stomachs so as to produce an immense distension, but this is comparatively rare. A small quantity of air may normally gain access to the stomach with the process of mastication and swallowing, but this leads to little or no evidence of its presence.

Nausea is frequently complained of and quite often offered as an excuse for failure to take food, or is even interpreted as an invitation to vomit. Nausea, on observation in such cases as we are considering, will be found most often with an empty or comparatively empty stomach and is the expression of irregular contractions of the muscularis, which may be invoked by the central nervous system or by a varying susceptibility of the mucosa, the muscularis being incited to an irregular irritative response by the stimulus of the gastric content. Aggravation of these fascicular contractions to the point of spasm leads to vomiting, and vomiting having occurred may be retained in the vicious circle by the psychic attitude of the patient.

Pain is a common symptom, the result of increased muscular tonicity, which latter may occur in any portion of the stomach but is most commonly located in the pylorus or in the cardia, (pylorospasm and cardiospasm). The stimulus of some local process such as an ulcer, or the presence of very acid chyme in the duodenum furnishes the necessary incentive to spasmodic contraction which is referred through the segment in the cord to the epigastrium very often with an associated tender point, which bears no relation to the subjacent ulcer or pylorus. One point in regard to all these nervous manifestations is the tendency of the patient to exaggerate the distress complained of, due to an increased irritability of the nervous system, along with the disposition to think of their troubles in the superlative.

In the management of these cases, assurance is of prime importance, the drug therapy being principally of a psychic character, but laxatives and bitter tonics with alkalis in the event of hyperacidity, and acid in cases of hypoacidity, and in some instances associated with soporifics to assure rest, may be of value and may have a real place in the treatment. A patient must be made to realize, by actual experiment, that many of the foods he has been wont to shun are productive of no more discomfort than those he has been in the habit of viewing as unirritating or easily digestible. Often they are already in possession of this information, but have failed to realize it, for they will frequently concede that it makes very little difference what they eat as far as discomfort is concerned. Coincident admission may be made of the taking of full, regular meals with little or no discomfort, when perchance their mental atmosphere happened, for some reason, to be less than usually impregnated with their gastrophobia. The patient can then be impressed with the necessity of taking an increased amount of food irrespective of any discomfort produced at first and encouragement and coercion may be utilized to continue them in doing so. A gradually increasing ability to ingest larger amounts with lessening distress and an improvement in general health ere long makes the eating become decidedly less irksome. It may seem a long time before there is evidence of the "zest" which may or may not have been formerly possessed, but the appetite will eventually be found somewhere in the vicinity of the health zone from which it seldom wanders far afield.

In addition, to attempt the management without due consideration of all the factors incident to its development dooms one to failure. The daily regime, the dietetic and mental habits, the social and domestic relations, the functional problems and the cares and worries, real and imaginary, of the patient must be inquired into and their relation to the problem carefully evaluated. Congenial surroundings and employment should, if possible, be furnished and the perverted mental viewpoint corrected. The "mental artillery should be trained outwardly, instead of inwardly on the digestive apparatus" and appropriate diversion will assist in directing the "diseased current of mental thought" to healthy channels. Dietetic restrictions and drugs, more particularly the so styled digestants, furnish often in these cases many therapeutic fallacies. True they should not be entirely neglected, but they must be regarded as a secondary consideration in correcting minor functional conditions. Sleep should be assured by mild soporifics which serve to remove the

ripple from their mental millponds, constipation corrected and relief given from various disturbing symptoms by appropriate medication while the attendant debility is taken care of by an abundant, well balanced diet sufficient to restore the body to a normal state of nutrition. Little or no attention should be paid to the warnings from various sources of the dangers of overeating. Incompetency is more frequently the result of under nutrition than of overfeeding.

These are some of the considerations which must concern us when confronted by the patient complaining of any of that group of disturbing sensations referred to the stomach and on which so much ingenuity has been expended in an effort to raise each one to the status of a clinical entity.

Tattooing.—At a meeting of the Royal Physical Society in Edinburgh a paper was read by Dr. Douglas Guthrie dealing with "The history and significance of tattooing and other forms of body-marking." The lecturer said that the decoration of the human body by designs was an ancient custom practised in Egypt and among the Inca and Maya civilizations. At the present day tattooing reached its highest level among the Japanese artists. In Europe generally the practice was largely confined to soldiers and sailors, although the designs, which were usually symbols of love, war and religion, could rarely be regarded as artistic. Professional tattooists now used electrically driven needles, with all the precautions of modern surgical technique. Recently it had been seriously suggested that surgeons should sign their handiwork by tattoo marks on the skin, so that a subsequent operator might know what had already been done. The significance of tattooing among various races had been the subject of much investigation. Crude scars produced by burning or cutting were made by the Australian aborigines and were believed to confer immunity against disease. Scarring was also common in Central Africa to denote the tribe or secret society to which a native belonged. Among fair-skinned races true tattooing with pigments was naturally more effective. It is believed by peoples so far removed as the Eskimo and the Fijian that tattoo marks persisted upon the soul after death and served as a means of identification in the next world. The elaborate facial tattooing known as moko denoted the social position of the bearer among the Maoris. The design of this was of great artistic merit ,and the custom of embalming tattooed heads had for a time rendered well tattooed Maoris unsafe, so that the export of heads had been prohibited by the New Zealand Government in 1830.—*Brit. M. J.*, January 8, 1927.

Relation of Hypertensive Toxæmia of Pregnancy to Chronic Cardio-Vascular Disease.—Study made by Jean Corwin and W. W. Herrick, New York, of 165 cases of the subacute or hypertensive type of toxæmia of pregnancy both during pregnancy and in a follow-up clinic has brought to light a striking relationship between this type of toxic disturbance and chronic cardio-vascular disease. In 165 cases thus observed, 122, or 74 per cent, exhibited cardiac hypertrophy, sclerosis of the brachial or radial arteries, vascular retinal changes, or persistent hypertension after a period of from six months to six years post partum. Of these, 37 per cent showed persistent hypertension. All patients with a blood pressure of 200 or over during their toxæmia showed cardio-vascular changes in the follow-up period; 90 per cent had well established hypertension, 100 per cent exhibited vascular retinal changes, 67 per cent cardiac hypertrophy, 57 per cent thickening of the radial and brachial arteries. It is of interest to note the high incidence of cardio-vascular changes (71 per cent) in the group of cases with pressures only slightly above the normal. Data indicate that a woman who has once exhibited hypertension in pregnancy is liable in subsequent pregnancies to show a similar or more advanced disturbance, and that as pregnancies are repeated she tends to maintain a hypertension in the nonpregnant state as well. Of the total 230 pregnancies carried five or more months by this group of women, 34, or 1.5 per cent ended as stillbirths. Corwin and Herrick incline to the view that the subacute, hypertensive toxæmia of pregnancy is the response of the woman with latent or declared cardio-vascular disease to the strain of pregnancy. Patients manifesting this type of disturbance should be observed over a series of years for evidence of cardio-vascular disease. Patients with cardio-vascular disease should be safeguarded by special medical care during pregnancy and should be discouraged from attempting further childbearing.—*J. Am. M. Ass.*, Feb. 12, 1927.

XUM

Case Reports

A CASE OF AGRANULOCYTIC ANGINA

By D'Arcy Prendergast, B.A., M.B., M.R.C.P. (*Lond.*)

Toronto

Miss G. G., aged 20, was admitted to St. Michael's Hospital, Toronto, under Dr. A. J. MacKenzie, July 28, 1926. She had not been in the best of health for several months, but worked as salesgirl till July 12th, when she complained of weakness, sore throat, and headache. On the previous day she had noticed blotchy bruises on her arms and hips. During the following days she had fever, fainting attacks, and bleeding from the mouth. July 23rd her vision became poor, and next day failed entirely. On admission to hospital her temperature was 104°, and her pulse rate 120. She was very pale, and showed a few petechial hæmorrhages on shoulders and legs. She was quite blind and had retinal hæmorrhages on both sides. Her tonsils and pharynx were swollen and bleeding, and covered by a yellow exudate. There were a few palpable lymph glands in the neck. Blood pressure was syst. 125; diast. 25. Physical examination was otherwise negative. Past and family history not significant. Throat swab showed no diphtheria bacilli. A blood culture was negative. Her hæmoglobin was 25 per cent, and her leucocyte count 10,000 per c.mm. The blood smear showed pale red cells; platelets and leucocytes appeared decreased in number. There were 90 per cent apparently normal small lymphocytes, and 10 per cent large lymphocytes. No polymorphonuclear or granular cells of any sort were seen.

During the two days following admission the patient had fever from 102 to 104 degrees. She became irrational, comatose, and died on July 30th.

Summary of Autopsy Report.—Large ecchymoses on thighs; smaller hæmorrhages on arms and shoulders, and chest. Pharynx and tonsils swollen and covered with yellow exudate. Palpable lymph glands both sides of neck. The right pleural cavity contained about 100 c.c. fluid blood. Both lungs showed œdema and congestion of the lower lobes. Microscopic examination of the lungs showed intense congestion, a patchy exudation of fluid into the alveoli, and in certain sections numerous bacterial clumps within the air cells; no leucocytic accumulation. The heart muscle was somewhat flabby, and showed small hæmorrhages in the wall of the left ventricle; the valves and coronary arteries were healthy; beneath the pericardium and endocardium of the left ventricle were scattered petechial hæmorrhages. The peritoneal cavity contained about 200 c.c. of fluid blood. There were hæmorrhages into the omentum and perinephric tissues. The kidneys showed a slight degree of cloudy swelling. The liver showed vacuolation of the parenchymatous cells. The pancreas and adrenals appeared normal. The spleen weighed 118 grammes, was firm in consistency, and somewhat glistening in appearance; microscopic examination showed an apparent reduction of the lymphatic elements, the sinuses full of blood, and the pulp containing many plasma cells. The bone marrow from the sternal end of the clavicle showed almost complete absence of granular cells, only two being found in the section. The lymphatic glands throughout the body were not enlarged.

Discussion.—This case fits in fairly well with a group described under the heading of "agranulocytic angina." During the past four years 30 or 40 such cases have been reported in Germany and the United States. These cases suggest an overwhelming infection centred chiefly in the throat; they are characterized by acute onset, fever, prostration, ulceration in the buccal cavity, and almost invariably a fatal termination. Only 3 recoveries have been reported, and 1 of these died two years later in a second attack. In this disease the red cells, hæmoglobin, and platelets show no constant changes, but there is invariably a very marked reduction or total absence of the granular type of leucocytes. The total leucocyte count has usually been well below normal, but in one of Zadek's cases, exceptional in that there was recovery, the white cells numbering 17,000 per c.mm. Possibly this case was in reality one of infectious mononucleosis. Gross hæmorrhages occurred in only one of the reported cases, but a few showed purpuric spots. About 80 per cent of the cases occurred in middle aged women. Autopsy findings showed a red bone marrow containing practically no granular cells. There was no splenic or glandular enlargement, aside from a slight enlargement of a few of the regional lymph nodes. There was no evidence of generalized sepsis and no cellular reaction about the site of ulceration. Piette's case, in distinction to others, showed many bacterial emboli in the spleen, liver, and kidneys, and in the spleen the lymphatic tissue was largely replaced by endothelial cells.

The diseases likely to be confused with agranulocytic angina are the acute fulminating type of purpura, aplastic anæmia, infectious mononucleosis, acute sepsis, and acute leukæmia.

Acute purpura and aplastic anæmia may be indistinguishable. They are characterized by severe hæmorrhages, anæmia with a low colour index, a reduction in the number of platelets, and a marked leucopenia; the polymorphonuclear cells are reduced both relatively and absolutely. Angina is unlikely; if present there is nothing to distinguish such cases from those reported as agranulocytic angina.

In infectious mononucleosis there is no tendency to hæmorrhage, the patient invariably recovers; the leucocyte count is usually well above normal; and the polymorphonuclears, while reduced in number, are never completely absent. In Longcope's 10 cases they averaged 30 per cent, and in only one instance were as low as 3 per cent.

In acute sepsis a positive blood culture is the rule, and the spleen is of the septic type.

Acute leukæmia may show exactly the same clinical features as the case reported here, and for a time the white count may be within normal limits. Usually, however, when the disease has reached the stage of high fever, sore throat, and prostration the count is so high as to leave little doubt as to the diagnosis. Even in the absence of a high count the blood smear will show a considerable proportion of immature leucocytes. In lymphatic leukæmia these will be of the nongranular series, and in the myelogenic leukæmia of the granular series. In either type of leukæmia autopsy findings are usually conclusive, showing in the one case widespread lymphatic hyperplasia, and in the other myeloid hyperplasia of the bone marrow, and myeloid deposit in the spleen, liver, and other organs. Occasionally it is difficult to differentiate the two types of leukæmia, as myeloblasts and lymphoblasts may have much the same appearance. Perhaps the strongest point against a diagnosis of leukæmia in the case under discussion is the total absence of granular cells in both bone marrow and blood.

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SPONTANEOUS RUPTURE OF THE DIAPHRAGM

BY BERNARD R. MOONEY, M.D.

Radiologist, Edmonton General and Misericordia Hospitals, Edmonton, Alta.

The remarkable feature of this case is that the patient was asleep in bed when the rupture occurred.

The patient was 23 years old, with a history of little importance except the following: he was admitted to the hospital April 23, 1921, for metastatic abscesses following erysipelas. Sixty-one separate incisions were made at various times. The transmission of infection appeared to be by way of the lymphatics. He was discharged July 25, 1921. On July 9, 1923, he was operated on for contracted tendons of the third and fourth fingers of the left hand and third finger of the right hand. Tendon grafts and transplants were done. At this time he complained of pain in the left shoulder and a radiogram of the left shoulder and chest was taken; it showed no evidence of abnormality of the left diaphragm. Patient has had at various times considerable abdominal distress, distension and flatulence, for which he had been dieting.

At 1 a.m., September 5, 1923, he awakened out of a sound sleep with sharp pains in the abdomen, difficult breathing and abdominal distension. The attending physician gave ¼ grain of morphine and washed out the stomach. Later he gave ½ grain of morphine and had the patient removed to an Edmonton hospital, where he arrived 36 hours after the initial attack. Hospital chart shows condition on admission to be as follows: severe abdominal pain, perspiration, rigid abdominal muscles, heart displaced to the right, no breath sounds over left chest, left side of chest tympanitic. The attending surgeon, Dr. A. W. Macbeth, made a diagnosis of ruptured diaphragm and asked for x-ray confirmation. About 2 ounces of ordinary barium mixture was given and entered the stomach at a higher level than is usual. The rugose appearance of the gastric mucosa and the duodenal bulb were identified and were in a position normally occupied by the left lung. The heart was to the right of the mid-

line and the left diaphragm could not be seen. The transverse colon, considerably distended with gas, appeared to be in the left chest also. Plates were made (Fig. 1) but on the account of the extreme condition of the patient, fluoroscopic examination was more satisfactory.

FIG. 1.—Position of barium filled œsophagus is indicated by arrows numbered 1. It is to the right of the mid line. Arrows numbered 2 point to a lesser curvature of the stomach. No. 3 to bulbus duodeni. No. 4 to gas-distended colon. The heart is considerably to right of normal position. The right diaphragm is well outlined.

At the operation the ninth and tenth ribs were resected and the left chest cavity found to be nearly filled with distended stomach and colon. About 40 ounces of fluid were removed from the stomach and after slightly enlarging the rent in the diaphragm, the stomach and transverse colon were returned, with some difficulty, to the abdomen. The tear, in the dome of the diaphragm, which appeared to be a recent one, was sutured. Fearing infection following the necessary force of manual reduction and the trauma, a mid-line abdominal incision was made and two drainage tubes inserted. The convalescence, although prolonged and stormy was satisfactory.

The following x-ray reports made by Dr. Malcolmson give concise information on post-operative progress: September 21, 1923: chest and stomach. One cannot make out left diaphragm with screen. Left chest is dense from apex to base. There is no evidence of hernia of abdominal organs. October 23, 1923: screen shows that the heart has resumed a more normal position than at the time of the former examination. There is still some fluid in the left pleura. The stomach is normal. On October 26, 1923, a barium enema was given. The barium went through the large bowel to the cæcum without any difficulty. Fig. 2. shows the condition on January 24, 1924.

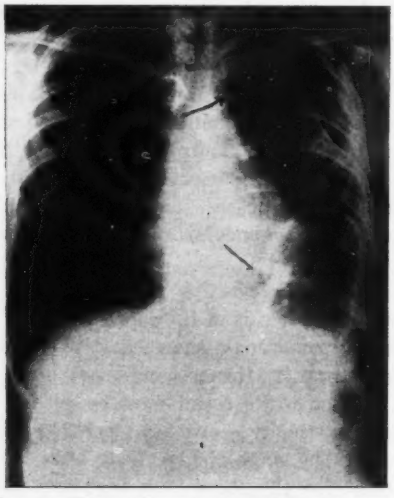

FIG. 2.—Plate taken four months after operation. Lower arrow points to location of repair in dome of the left diaphragm. Upper arrow to remains of a pneumothorax.

It is probable that the attenuated and atonic condition of the musculature of the left dome of the diaphragm noted at the operation was a congenital defect and that the patient was having one of the attacks of flatulence noted in his history. Together they were the only explanation of the rupture we could find.

Routine x-ray examinations of the gastro-intestinal tract not infrequently disclose a congenital defect in the diaphragm, particularly the left dome, through which the stomach and other abdominal viscera have herniated. There is also the more common form of diaphragmatocele resulting from trauma, sudden muscular strain or effort. I have been unable, with the literature at my command, to find a case in which the combination of congenital weakness of the muscle tissues and flatulence were the cause of rupture. It seems more strange when one considers that the patient was asleep for some time before it occurred.

A letter received from the patient on March 15, 1925 stated: "I am well and happy, if not prosperous."

TWO CASES OF HERNIA INTO PERITONEAL FOSSÆ

By R. B. Malcolm, M.D.,

Montreal

The two following cases of intra-abdominal hernia have been thought to present features of interest.

Case 1.—W. J., a youth of 22 years, was perfectly well until January 27, 1927. He then developed pain in the left upper abdomen, which became very severe and paroxysmal. When spasms were present the patient writhed in agony and the pain was chiefly referred to the left upper quadrant. During the night he vomited and was given a dose of castor oil by an attending physician. The bowels moved with the oil. A hypodermic was given which relieved the pain temporarily. On the morning of January 28th the pain re-commenced, was colicky and extremely severe, paroxysmal and referred chiefly to the left upper quadrant. . He was admitted to the Montreal General Hospital on the evening of January 28th, temperature 97, pulse 80, respirations 20. The patient was quite prostrated, perspiring freely and suffering at intervals of 10 to 15 minutes with acute abdominal pain, mostly referred to the left upper quadrant.

On examination of the abdomen there was slight distension above the umbilicus. During the paroxysm of pain the abdomen was rigid, but this was much less marked during the free interval. There was some dullness in the left flank, which was not moveable. There was no tenderness over McBurney's point, but marked tenderness over the left upper quadrant just to the left of the midline, about 1 inch to 2 inches above the umbilicus. Leukocyte count was 17,500; urine negative. The case was considered one of intestinal obstruction.

He was operated on January 29, 1927, under intratracheal ether anæsthesia. A left rectus incision was made extending to just below the umbilicus. On opening the abdomen some bloody fluid was found. The left upper quadrant was then explored and several loops of contracted small bowel were drawn up, commencing just about 18 inches below the duodeno-jejunal flexure. Above the contracted bowel a mass of small bowel was found herniated into a cavity bounded above by the transverse mesocolon, extending into the duodeno-jejunal fossa. The hernia was held in this position by a band of omentum extending from the left transverse mesocolon, obliquely down and anchored into the tip of the appendix. The omentum which had caused the hernia was removed. On removal of the herniated mass the colour and contour of the bowel became normal. There was no necessity of resection. The abdomen was closed without drainage. Recovery was uneventful.

Case 2.—W. W., a youth aged 18. He was perfectly well until 5 a.m. on the morning of February 2nd, when he was seized with severe pains in the lower abdomen. Pain was recurrent and colicky in nature. He vomited shortly after the commencement of the pain. --Vomiting occurred three times. The bowels moved at 7.30 a.m. He was admitted to the Montreal General Hospital at 11.30 a.m. His temperature was 97, pulse 92, respirations 22, leukocyte count 22,700. He gave a history of a similar attack 3 months ago. Two weeks ago had swelling of the right scrotum. Examination of the abdomen showed it to be soft, smooth and symmetrical, no tenderness, no rigidity in any part. Slight tenderness over McBurney's point on deep palpation. During the attack of paroxysmal pain abdomen became very tense, mostly below the umbilicus. Rectal examination showed tenderness high up on the right side, no palpable mass. It was considered to be, in all probability, an acute appendix.

Operation at 2.00 p.m., February 2nd, under intratracheal ether anæsthesia. The McBurney incision was employed with splitting of the muscle. No free fluid was found in the peritoneal cavity. On examining the abdominal cavity the small bowel, just proximal to the ileo-cæcal valve, was found to be contracted, showing the presence of an obstruction. There were three loops of small bowel caught underneath the cæcum in the ileo-cæcal fossa and held in this position by an adhesion extending from the ileum just proximal to the ileo-cæcal valve and attached to the lateral wall of the right side of the pelvis, thus increasing the depth of the ileo-cæcal fossa. The adhesions were dissected away and the appendix removed. The bowel refilled on release. The abdominal wall was closed without drainage. Recovery was uneventful.

XUM

Reviews and Retrospects

BLOOD TRANSFUSION IN TREATMENT OF DISEASE

By C. K. P. Henry

Montreal

The Section of Medicine at the 1926 annual meeting of the British Medical Association at Nottingham considered papers by Sir Humphry Rolleston and others on blood transfusion in the treatment of disease. These several papers and the discussion thereon form an up to date résumé of this subject.* The historical note attributes the original idea of this treatment of disease to Francis Potter, B.D., in 1639, and he and R. T. Gunther of Oxford carried out unsuccessfully the first experimental blood transfusion in a hen in 1650. Richard Lower, in 1665, successfully transfused dogs, and with Edmund King transfused a Bachelor of Divinity of Cambridge in November, 1667, using a sheep as a donor, as also did Jean Denys of France in the first human transfusion earlier in the same year. However, as late as 1889 William Hunter in his lectures stated, "For practical purposes all the advantages to be gained by transfusion may be equally well and more readily obtained by infusion of a neutral saline solution of common salt." Its present popularity dates from the safety insured for it by the discovery of the four human blood groups by Jansky in 1907 and Moss in 1910, so that 270 years represents its first phase and 16 years its second. During this latter period we have come to accept certain verities.

Ashby's differential agglutination method has determined that transfused blood corpuscles live and function in their host for an average of 83 days, with 50 and 113 days as extremes. In diseased hosts they live longest in pernicious anæmia and much shorter periods in hæmolytic jaundice, myeloid leukæmia and aplastic anæmia.

Post transfusion reactions occur in about 25 per cent as an average, from a series given by six authors using citrate or whole blood methods. Gross reactions are due to air embolism, pulmonary œdema or incompatibility of bloods of donor and recipient. In cases of repeated transfusions and large transfusions, in high grade anæmias and in pernicious anæmias, reactions occur more often than the average. In other conditions destruction of the platelets or of the leucocytes may be at fault and such may be tested for prior to transfusion. The variety of reactions are: (1) acute and fulminating, due to agglutination and hæmolysis; (2) delayed or proteolytic response in 1 to 12 hours post transfusion; and, (3) systemic or constitutional, which is not due to hæmolysis, but of what nature is not known, though they are possibly due to incipient coagulation or agglutination of leucocytes or platelets.

Transfusion does good by restoring the blood volume as in hæmorrhagic shock, by restoring the styptic properties of the blood, and by supplying antibodies and free hæmoglobin in cases of CO and similar poisons. It also acts on the bone marrow as a powerful hæmopoietic, and is of great value in many toxæmias, as, for example, the toxæmia due to burns. Consequently, the indications for transfusion are acute anæmia due to hæmorrhage, external, internal or concealed; chronic anæmia due to hæmorrhage or disease; as a prophylactic against operative shock or expected hæmorrhage; and in hæmorrhagic diseases as pernicious anæmia, purpura, hæmophilia, etc.

It is noted that transfused blood platelets are supposed to live only a few days, four to six, hence the unsatisfactory results in purpura hæmorrhagica without splenectomy. It is indicated where calcium is fixed by the bile salts in the blood as in jaundice, where exsanguination transfusion may be necessary. In pernicious anæmia transfusion initiated a remission in 56.3 per cent of Ander's 362 cases. Recent acute cases are seldom benefited, nor are cases without remissions, nor patients over 60 years of age. Small, repeated transfusions are of most value in pernicious anæmia cases.

The acute septicæmias are not helped and they may be harmed by the formation of abnormal agglutinins and hæmolysins. Citrated blood is less bactericidal than whole blood and is of no value in acute hæmic infections according to Colebrook and Storer, but others note that the citrate increases the coagulability of the blood, which increases its bactericidal tendency and inhibits the growth of staphylococci in the blood. Consequently, in septicæmias blood transfusion may be of value if used early and often. It is indicated in intoxications such as eclampsia, oliguria and impending anuria and in the debility of marasmic infants.

The use of cases of polycythæmia as donors is noted with mutual benefit. (One case here in Montreal has been used about 20 times.—C.K.P.H.)

Rene Cruchet, in 1921 and later, seems to have established the safety of transfusion from animal to animal and from animal to man; in the latter case without the 16 per cent fatality that existed in 1860 when carried out by Prof. Ore of

* *Brit. M. J.*, Nov. 27, 1926.

Bordeaux. Sheep's blood in small quantities, 25 to 80 c.c., was used ten times in eight patients; horses' blood was used fourteen times in twelve patients. Reactions seem to have been very frequent, over 60 per cent (!) and were sometimes severe, with hæmoglobinuria. One case, where 1 to 2 c.c. of horses' blood was used, terminated fatally. (His conclusions and comparisons between heterologous blood transfusions and the usual type of human blood transfusions do not seem conclusive on reading the reports given.—C.K.P.H.)

The microphotographs of the admixtures of heterologous bloods are most instructive, proving that hæmolysis occurs nearly always in transfusions from animal to man. He stresses, correctly enough, that reactions may be due to too rapid inflow in many cases. He proves the inadvisability of using a donor who has done any great muscular work during the one or two hours prior to transfusion.

One author uses 100 c.c. of 4 per cent citrate solution to each 500 c.c. of blood, which seems an excessive citration, as usually, 50 c.c. of 2 per cent is used for 450 c.c. of blood. The increase in the rise of the red cell count and the hæmoglobin is more rapid after transfusion than with other remedial agents, diet, rest, iron, etc.

In London the Blood Transfusion Service, under the organization of the British Red Cross Society, has organized the providing of donors and it issues annual reports. The demand for donors has risen rapidly, from 13 in 1922 to 428 in 1925. The proportion of calls for donors is, roughly, medical cases 1, surgical cases 2 and in the surgical calls half are for "gastric or duodenal" cases and here, in 90 out of 121 cases, the result was "good" or "very good." In septicæmia or pyæmia there was no benefit in 22 out of 25 cases.

In gastric cases Geoffrey Keynes, of St. Bartholomew's, stresses the importance of transfusion in gastric or duodenal hæmorrhage in preventing death from hæmorrhage, or in making possible a necessary operation, which would be unsafe without transfusion. He states that such hæmorrhage is often fatal, contrary to an oft quoted statement that fatalities are rare in hæmorrhage from peptic ulcer. Again, paradoxically, citrated blood increases the clotting time of the host's blood. Cases are cited of operation following transfusion for severe hæmorrhage, and success is frequent where operation results in direct treatment of the ulcer. Prof. Gask operates on critical cases while transfusion is being carried out at the same time, and often with a pre-operative transfusion as well. It is reported that fewer reactions occur after transfusion of defibrinated blood and that more good results are obtained in cases of septicæmia and pyæmia when defibrinated blood is used.

Conclusions

Blood transfusion is rapidly increasing its field of usefulness in medicine, gynæcology and surgery. The most elastic and most widely used method is the citrate method.

The reactions, which occur in about 25 per cent of cases, are the only ill results.

Transfusion is disappointing in acute septicæmia and pyæmia. (Transfusion of defibrinated blood produces fewer reactions and may be of more value in septicæmia.) Cases of polycythæmia give better than average results as donors.

Animal to man transfusions, though possible, do not warrant the increased danger in agglutination and hæmolysis. In hæmorrhage from peptic ulcer, transfusion is of great post-hæmorrhagic, pre-operative and post-operative value.

In large cities a central organization to provide donors is of great service.

AN ADDRESS ON PROPHYLACTIC AND THERAPEUTIC IMMUNIZATION*

By James McIntosh, M.D., (Aberd.)

Professor of Pathology, University of London

Active immunization is now recognized as a very definite prophylactic and a possible therapeutic practice in medicine. Prophylactic vaccination especially has been most thoroughly vindicated by the results achieved. Largely by its means smallpox has become rare, and in well vaccinated countries has practically disappeared; and one of the striking features in the medical history of the Great War was the almost complete absence of typhoid fever as compared with its high incidence in former wars. As regards therapeutic vaccination, however, although in certain conditions striking results have been obtained, yet thus far in many instances only failures have to be recorded.

Even in ancient times it was known that a previous attack of an infective disease rendered the individual immune or resistant to a second attack. Thus in smallpox the introduction of variolous matter under the skin reduced in many instances the virulence of the virus and led to a less severe attack of the disease. Jenner, however, proved in his brilliant experiments that cowpox rendered a man immune to smallpox, and as a result of his thoughtful work vaccination became general over the whole world. Pasteur and his collaborators expanded the idea of Jenner and applied it to other infections both human and animal.

* Being the presidential address delivered in the Section of Pathology of the Royal Society of Medicine, October, 1926.

As an inference from the successful work of both Jenner and Pasteur it was believed for many years that the use of a living but attenuated virus was an essential factor in the production of an efficient vaccine for conferring immunity; a view which greatly restricted its application in human medicine. Gradually, however, this belief has been broken down, and first Haffkine with his plague vaccine, and afterwards Wright with his typhoid vaccine used dead instead of living virus. It is chiefly to Wright, however, that we owe the knowledge that killed cultures provide an efficient means of producing immunity.

During the past few years we have seen attempts to simplify prophylactic injections still further by employing where possible simple bacterial products, toxoids and even aggressins. The toxins may also be modified by the addition of antitoxin. There is now only one human disease (smallpox) in which the injection of the living virus is still widely used to secure immunity. Scientifically, it cannot be disputed that the injection of virus capable of multiplying in the body of the individual is bad. When multiplication of the virus occurs, there is no possibility of estimating the dose to which the patient has been subjected. Its effects therefore cannot be controlled and in susceptible individuals may lead to unforeseen results. From time to time attempts have been made to re-introduce the use of an attenuated living virus as a prophylactic measure in other human diseases. Particularly is this true in regard to tuberculosis. This I regard as an innovation which should be rigorously opposed and regarded as a retrograde step.

For the attempt to use bacterial immunization as a curative measure we are also indebted to Wright and his collaborators. Unfortunately the attempt has thus far not proved very successful. At the outset, the originators insisted on the necessity for the specificity of the reaction only obtainable by the use of specific vaccines. At the present moment, however, there is a tendency for the pendulum to swing the other way, and it is now recognized that other substances, particularly of a proteid nature, may have some therapeutic value. There is little doubt that a certain amount of stimulation not infrequently follows on the injection of any substance which may be regarded as a foreign protein. As long ago as 1912 it was noted that the rapid healing of leg ulcers, chronic eczema, etc., took place after an injection of what we then believed to be normal saline. Subsequent investigation showed that this saline prepared from distilled water contained large numbers of dead bacteria. The injection of such saline intravenously frequently gave rise to a considerable reaction on the part of the patient. A rigor followed with a rise of temperature of 2° to 3° C., associated with headache and a rapid pulse. The temperature reached its maximum in about three hours time, and then acompanied by sweating it fell to normal. After this fall, the healing of various skin lesions appeared to be greatly stimulated. Acting apparently in a similar manner a considerable amount of success has followed the use of other non-specific proteid injections, in such disorders as chronic ulcers, chronic eczema, and rheumatoid arthritis. The dosage must be sufficiently high to produce a well marked tissue response. The general consensus of opinion at the present seems to be that non-specific or protein shock therapy has come to stay, and that in many subacute and chronic infections it may give striking therapeutic results.

As a result of this success attained by non-specific therapy, there has arisen a tendency to minimize the value of specificity. This from a scientific point of view, Prof. McIntosh considers to be erroneous. Immunologists now recognize that resistance to infection following the use of vaccines depends mainly on two factors: (1) the production of specific antibodies; (2) the sensitization of the tissues to the virus. After anti-typhoid vaccination, antibodies can be demonstrated in the serum for several years, but even after these can be no longer demonstrated the tissues are still sensitized as shown by the rapidity with which antibodies can be produced on the injection of an anti-typhoid vaccine. Regarding the mode of action of non-specific therapy one definite fact appears to be established, namely that in most instances the injection is followed by a leucocytosis. The general tissue response is apparently dependent on the pyrogenetic properties of the foreign proteid, a reaction which must be regarded as a process identical with that which occurs in the fever which accompanies a natural infection. Such a fever is now regarded as part of a protective process, and should rarely be suppressed. During a fever response the general metabolism is increased, circulation is quickened, and the flow of lymph becomes more rapid. In this way there is an increased flow of all the protective substances through the tissues of the body, together with an increased rate of removal of the waste substances. Such a reaction has a tendency to stimulate improvement in the various lesions. The increase in the leucocytes, however, would appear to play a very important part in the destruction of the bacteria by exerting an increased phagocytic and ferment action.

Professor McIntosh considers, therefore, that so far as there is any evidence it would appear that the curative effects of all non-specific

antigens depend chiefly on the general tissue reaction and the leucocyte response. Experiments have further confirmed the specificity of a true immunity reaction indicating that the full value of therapeutic immunization can only be obtained by the use of specific antigens.

In conclusion the lecturer stated that in therapeutic immunization two factors are at work, a specific and a non-specific. The specific is a typhoid antibody response, while the non-specific appears to be mainly dependent on a general stimulation of the tissues and leucocytes in a process comparable to fever, and during recent years there is an increasing tendency to make use of this non-specific response which in many cases may prove valuable.

ON ACUTE POLIOMYELITIS

Acute poliomyelitis forms at the present a frequent and important subject of discussion at many of the medical societies in Great Britain. At a recent meeting of the *Medical Officers of Schools Association*, Dr. James Collier read an interesting paper on the clinical features of this disease. When first he entered on his medical studies forty years ago, he said that there was no suggestion that poliomyelitis was an infectious disease. Twenty years ago the view was put forward that it was infectious by contact only; and now many hold the view that it is not infectious in the sense of a case-to-case infection and think the future will show that the disease is chiefly spread by carriers.

It was a disease, he said, with many unexpected phases, and no one could prophesy what it might do. He thought it unlikely that it would play any terrible havoc in England, unless first of all, it entirely disappeared; but thus far poliomyelitis persisted the year through amongst us, and in London cases appeared nearly every month. The community, therefore, appeared to be to some extent, immunized. On the other hand, who could have predicted that in the comparatively small area of New York and its surrounding towns tens of thousands of cases would appear in a comparatively brief period, and that nearly 5,000 deaths would occur in New York itself. Somewhat similarly, in one small isolated village in the west of England with a total population of 119 souls, forty-five persons were attacked with poliomyelitis in the course of a few days. Every house had its two or three victims.

The grouping of the various forms of the disease on an anatomical basis as suggested by Wickman had been criticized as being neither clinical nor scientific, but it was convenient, and no one had yet offered a better classification. His division is as follows: the abortive, the neuritic, the spinal, the meningitic, the brain-stem, the cerebral and cerebellar. Some of the forms are so well known as to make any description superfluous. The neuritic class differed only slightly from the spinal type, but was associated with great pain and tenderness in the paralyzed region, thus often increasing the apparent amount of the paralysis. So prominent a feature was the pain that the lecturer many times had been called to see cases of supposed acute rheumatism which were really cases of poliomyelitis. It was well to remember that while rheumatic pain generally increased the reflexes, poliomyelitis generally abolished them.

Not infrequently curious relapsing cases are met with in which the patient seems to become apyrexial and convalescent, but in a few days all the original symptoms return. Such relapses may often be anticipated by watching the temperature chart. If instead of the customary peak there is a flat topped temperature curve for the first few days, with little jumps of temperature in the apyrexial interval, a relapse may be expected. The lecturer had never seen any increase of paralysis following these relapses. Indeed, in the case of an eight day relapse with high fever and great restlessness the paralysis appeared to improve steadily. Many rashes had been described in poliomyelitis, but only two were worthy of mention. One was herpes zoster, the other, a striking rash of peculiar appearance and distribution consisting of large bluish papules distributed over the paralyzed region only.

It has been long held that the ensuing paralysis was entirely due to the destructive action of the inflammatory exudate on the nerve cells. Dr. Collier said that a study of the experimental disease in monkeys appeared to indicate that we had also to deal with the effects of a paralyzing toxin developed somewhat later. Poliomyelitis in the speaker's opinion did not spread, as infectious diseases did, in schools, institutions or large communities. In one of the more severe epidemics in America forty-five schools in the infected locality containing 3,600 children of susceptible age were kept under observation and only one case occurred. At the Hospital for Sick Children in London there was no record of the spread of the infection to another child.

In replying to some questions asked after the paper, Dr. Collier said that the carrier was not a hypothetical individual. He had been caught several times after infecting others. So far, however, there were no practicable means of detecting a carrier apart from lumbar puncture. Moreover, when there were no definite nervous signs he did not know any means of distinguishing a carrier, as lumbar puncture does not of necessity make possible the recognition of the disease.

At a meeting of the Medical Society of London held a few days later, with the President, Sir Humphry Rolleston in the chair, a discussion on the same subject took place. It was opened by an address of Dr. F. M. R. Walshe who enumerated some of the many difficulties associated with this disease and was, he said, a disease with great responsibilities for the medical attendant. The disorder was essentially an acute

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specific fever which might or might not proceed to invasion of the central nervous system. In epidemics many so-called abortive cases occurred amounting to upwards of nearly 50 per cent, and in these recovery might take place without any paralysis. The disease manifested itself in three phases, any one of which might vary greatly in its severity. The first, the stage of general infection might last from a few hours to three or four days, and the amount of reaction might be slight or brisk, with the temperature rising from 101° to 103°. The child suffered from general malaise, and the special symptoms were either gastro-intestinal, tonsillar or coryzal in nature. The second stage represented the invasion of the sub-arachnoid or meningeal region; it was characterized by fever, headache, pains in the back, rigidity of the spine, and sometimes tremor of the limbs. If lumbar puncture was done the cerebro-spinal fluid would usually be found under pressure, with an increase in the number of cells, and increase in the globulin. While recovery might occur at this stage, a large percentage passed on to the third stage with the development of paralytic phenomena in certain groups of muscles. The paralysis appeared suddenly, as a rule, was maximal at its onset, rarely it might extend up the cord or appear to move from limb to limb; pain was often present and might be widespread. Diagnosis in the pre-paralytic stage consisted in recognizing the early signs of subarachnoid involvement. In Dr. Walshe's opinion only one drug appeared to have any value, and that was hexamine which ought to be used in massive doses associated with alkalies. The serum of convalescent patients contained immune bodies, and appeared to have a definite therapeutic value, and should be administered intrathecally, subcutaneously and intravenously. The cerebro-spinal fluid should be drawn off freely and the serum given in doses of 10 to 15 c.c. by the gravity method. The treatment of paralyzed muscles involved the maintenance of physiological rest.

Professor J. McIntosh, who followed Dr. Walshe, spoke on the pathology of the disease. Summarizing the histological lesions, he described the typical perivascular infiltration met with in the grey matter of the cord; the infiltrating cells being principally lymphocytes with a few larger cells containing a clear nucleus. Hæmorrhages were often a marked feature. These changes indicated an infective origin, but bacteriological investigation had thus far proved negative. Nevertheless, the disease had been successfully transmitted to monkeys producing a disease in every respect comparable with poliomyelitis in children. There was an average incubation period of from nine to ten days, followed by high temperature, weakness and trembling in the limbs, and paralysis usually appearing in from twenty-four to forty-eight hours. Experimental work showed that the virus of the disease belonged to the filter passing group of organisms, and was very resistant to certain influences and agents such as drying. Fifty per cent glycerine with 5 per cent carbolic acid failed to destroy it. The virus appeared to have a special predilection for the grey matter of the cord. Of tissues outside the nervous system only the lymphatic system contained the virus. The naso-pharynx had been shown to be the chief site of penetration for the virus; the secretions from the naso-pharynx, urine and fæces appeared to be infective, even in carriers and abortive cases. No satisfactory evidence had yet been brought forward to show that any biting insects played any part in the spread of the disease. The mucus of the naso-pharynx had been found to contain the virus for a long period.

Berlin Schools for the Hard of Hearing.—In Greater Berlin there are at present six schools for the hard of hearing, which are attended by 410 children. As Prof. Dr. Brühl, expert adviser to the schools in ear diseases, recently stated in an address before the Otolaryngologic Society, there are about 72,000 school children suffering from ear disturbances, 7,250 of whom are hard of hearing, while 700 or more (10 per cent) are extremely hard of hearing. An otologic examination of all school entrants does not appear feasible, and the regulation requiring all children who are hard of hearing to be sent to the ear specialist for examination, as far as Brühl's observation goes, seems to exist only on paper, for it is seldom complied with. Hundreds of schools have not sent any children whatever for examination, and furthermore, it is well known that children who are hard of hearing are often able to read lips well and thus conceal their defects from the teachers and the school physician. Brühl suggests, therefore, that children who fail to be promoted in school be referred to the school ear specialist, since frequently high-grade hardness of hearing is the cause of their failure. Fifty per cent of children who are hard of hearing are suffering from chronic bilateral ear suppuration; 20 per cent have ailments that are curable if they are subjected to prolonged treatment, and that they are not so treated is owing to the indolence of the parents; 20 per cent have some disease of the inner ear. Stobschinski, teacher of deaf mutes, supplemented the account given by Brühl, and emphasized that the school for the hard of hearing gives its pupils the same training that pupils with normal hearing receive. This is accomplished by teaching them to read lips. Stobschinski illustrated some of the methods employed in teaching lip reading, which presuppose considerable skill and experience on the part of the teacher. The work requires a great deal of individual instruction.

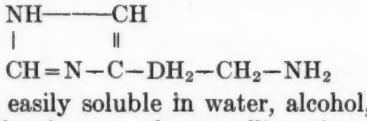
Editorial

HISTAMINE

THE word "histamine" would seem to have a comfortable sound, reminiscent of the old lady's "blessed word Mesopotamia." Whenever a new or supposedly new internal secretion has been obtained, one of the first questions investigators appear to ask themselves is "Is it histamine?" Sooner or later they conclude "It is not histamine." Most investigators (there are notable exceptions) consider that secretin, the internal secretion of the duodenum, is not histamine. It is agreed that the internal secretion of the posterior portion of the pituitary is not histamine, and that the essential action of liver extracts in lowering blood pressure is not due to histamine.

What then is this histamine, which so many things are not? What powerful properties does it possess, liable to confuse it with powerful internal secretions?

Histamine rejoices in the name *beta-iminazolyl-ethyl-amine*, which is to say that it is a derivative of ethyl alcohol in which the hydroxyl (OH) group is replaced by an amine (NH_2) group, while the furthest hydrogen atom from that hydroxyl group is replaced by the peculiar azolyl ring, built up from three carbon and two nitrogen atoms, which also occurs in several other compounds of biochemical importance, such as, for example, creatinine. Histamine has, therefore, the constitutional formula—



It is easily soluble in water, alcohol, and hot chloroform, and crystallizes from the last-named solvent in colourless needles, melting at 83°C. It is a derivative of the amino-acid *histidine*, and is formed from it simply by removal of carbon dioxide from the acid radical—

$$R{-}CH(NH_2){-}COOH \rightarrow R{-}CH_2{-}NH_2{+}CO_2$$

This change is very easily brought about by bacteria; over thirty species of bacteria can effect it. Since histidine is an amino-acid we cannot manufacture for ourselves but must have, so that we must eat proteins containing its radical, and since it would appear that we higher animals are condemned for all existence to support bacterial parasites, histamine will always be formed in our intestines. Since it easily diffuses through animal membranes it can continually invade the organism to carry on the pharmacological actions it possesses.

Bacterial action almost certainly also accounts for its presence in ergot of rye (from which it was first isolated) and other fungi and in any putrefying material, such as decomposing fish muscle, yeast, and soy beans (in all of which it has been detected). It actually is most easily prepared by the action of bacteria on histidine added to a bacterial broth, with subsequent isolation by the usual chemical procedures.

Relatively large doses of histamine are comparatively non-toxic to cold-blooded animals. Much smaller actual doses, a few milligrams, injected subcutaneously, and especially intravenously, are fatal to rabbits and guinea-pigs. In the mammal it produces a whole series of effects, varying somewhat in herbivorous and carnivorous animals, but of which the most significant are: (*a*) relaxation of the capillaries and such marked degree of damage to the capillary walls that there is passage of plasma across them, the combined result being lower and lower blood-pressure, which, in spite of increased heart action, may lead to total disappearance of the pulse, and the general symptoms of what is termed "histamine-shock"; (*b*) a transient decrease of frequency of the heart-beat, followed by increase in frequency and strength of contraction, and still later a weakening, due to developing anæmia and contraction of the coronary circulation; (*c*) stimulation of smooth muscle, shown in the constriction of arterioles throughout the circulation, and the con-

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traction of the bronchial musculature and the isolated uterus.

Many of these effects are counteracted by adrenine, but the two compounds are not completely antagonistic. Histamine itself appears to be capable of replacing in part the activities of vitamin B, since it tends to prevent antineuritic symptoms developing in pigeons and rats on diet deficient in this vitamin.

Recently Sharpey-Schafer and Macdonald[1] stated that alcohol extracts of commercial pituitary preparations have actions completely paralleling those of histamine, when injected into animals such as the cat, dog, rabbit, and monkey (the effects after removal of this fraction being regarded as those really due to the internal secretion). Though only physiological methods were employed, admitting that histamine was present—final proof requires its chemical isolation, since other compounds closely related to it chemically give similar physiological reactions—yet before it can be accepted that histamine is present in the pituitary gland in the living animal it will be essential to disprove possibility of bacterial decomposition of protein during removal of the gland, its storage (possibly of some duration), and its final treatment to give pharmaceutical preparations such as these investigators employed. Some years ago Dale and Dudley concluded that "histamine, if present at all, occurs in such minute amounts that its chemical identification is impracticable."[2]

Best, Dale, Dudley, and Thorpe are stated to have communicated a year ago to the British Physiological Society the announcement that they had isolated histamine from ox-liver by a tedious and complicated process. Their work does not appear to have been published. Swale Vincent and F. R. Curtis[3] have just published an account of physiological experiments seeking to determine to what is actually due that fall in blood pressure which follows injection of tissue extracts and which is frequently attributed to a mixture of histamine and choline supposed to be present. They conclude that while the blood pressure curves so obtained strikingly resemble those following an injection of mixed histamine and choline, yet "the depressor effect of tissue extracts cannot be accounted for on the assumption that their action is due solely to their histamine and choline content," since in rabbits after 30 to 45 minutes' ether anæsthesia all tissue extracts produce a fall of blood-pressure, while histamine-choline mixtures produce a rise.

It seems still to be legitimate to state that we have no definite evidence that histamine is ever produced by the metabolic processes of mammals, although bacteria produce it from histidine with the greatest of ease.

One further point requires discussion. Can this highly toxic compound, which, injected into man, leads to lowering of blood pressure, bronchial spasm, tendency to vomit, and other definite symptoms, ever be absorbed from the intestinal tract in sufficient concentration to help in the production of that auto-intoxication on which Sir Arbuthnot Lane has laid such stress and other authorities much less stress. Alvarez[4] has summarized much evidence in favour of many of the symptoms commonly ascribed to auto-intoxication being due simply to mechanical plugging of the lower end of the canal, leading to reverse peristalsis. But on theoretical grounds the view cannot lightly be dismissed that in any marked degree of intestinal stasis toxic compounds produced by bacterial action (including histamine) may be absorbed in such concentration that the detoxication mechanisms of the liver will prove inadequate and definite pharmacological actions will result. A. T. Cameron

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2. Dale and Dudley, *J. Pharmacol.*, 1921, xviii, 27-42.
3. Swale, Vincent and Curtis, *Endocrinology*, 1926, x, 484-92.
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A SENSE OF INFERIORITY AND ITS INFLUENCE

A VERY interesting lecture was delivered by Dr. Alfred Adler of Vienna on November 15th to the Royal Medico-Psychological Association, on a *Sense of Inferiority and its Consequences*. Every human being, the speaker said, was continually striving to develop himself in some degree towards a self-satisfying completion, the achievement of his life's purpose. A normal man had in the main three great problems to solve. First, there was the problem of social relationships, the desire to take some place in the world. The neurotic, in whom some failure in effort was usually marked, was always trying to escape from this normal phase of social life. The second problem was that of occupation. The two were not wholly separated, for, every occupation was, or should be, an effort to fill a niche of some usefulness. To accomplish this purpose induced a feeling of self-respect and well being; while failure in filling a definite place in the world's work induced a feeling of inferiority and sometimes of hatred to one's surroundings. The third problem was that of sex. To unite with someone of the opposite sex was the normal goal for everybody. If any one of these problems was being evaded it developed a lack of self confidence, and a lack of courage, such as was frequently met with in neurotic subjects.

The lack of courage might also arise from organic defects in childhood. To delicate children the world was a great difficulty. A feeling of personal inferiority was in many cases engendered by physical defects and deficiencies, and by imperfect vision or hearing at the age when the child found he had to face difficulties. In many cases this feeling of inferiority is increased by enervating sympathetic help given a child. A child that lives in a symbiotic manner like a parasite receiving everything from others rarely develops a normal view of life. Such children, suffering under some organic defect and spoiled by persistent petting, are apt to fail when faced with difficulties, unless they are educated to acquire a command of their will power in every situation. Neurotics often begin life as spoilt children; undue sympathetic petting from parents makes it difficult for them in later years to attain a life of independence and a capacity of working with others for common usefulness. There is a third type of child in which this sense of inferiority is apt to develop. This is the disliked child, often an illegitimate one, who grows up without the sense of love, and with a feeling that he is unwanted; the world to such is comparable to an enemy's country. Children of this type develop what may be termed a defensive attitude. They have no desire to join with the efforts of others and appear always to be in a situation of conflict. To accomplish their desire for power they restrict their environment, they evade work, and they make little return for love. Indications of an effort to shirk the problems of life can in many patients be thus traced back to childhood. Furthermore, spoilt children develop an unfortunate control over the individuals who spoil them. Agoraphobia in the neurotic makes a constant demand on the services of another, and the other too frequently finds he must obey. In the family the neurotic demands that all the family take care not to irritate his mental whims and aches. The development of such attitudes in life the physician must endeavour to prevent. Efforts are better begun in childhood. The aim of parents should be to develop a feeling of independence notwithstanding any defects that may be present, thus giving him sufficient self confidence to develop social feeling, respect for others and for himself and a strong desire to be of service for the general good. If the patient has reached adult age efforts should be made to re-educate him. The attitude of the physician should be parental. Such patients require honest and frank handling; no excessive demands should be made when inability exists, but wills should be gradually strengthened and courage developed to make the best of their life.

THE CHANGING CHARACTERS OF DISEASE

IT is an observation of general experience that disease may show itself in different forms in different individuals. but it is now becoming evident as well that the whole clinical character of diseases themselves may alter in course of time; and this to such an extent that we may regard some diseases as now almost non-existent, and others as at least presenting fresh characteristics.

This variation of the clinical character of disease should receive more recognition in our textbooks than it does, and it is, therefore, valuable to have an authoritative survey of the matter by Sir Humphry Rolleston in his Presidential address to the Medical Society of London.* He shows that in certain diseases it is possible to trace these changes fairly easily. Scarlatina, *e.g.*, was very mild in type a century ago, became extremely malignant fifty years later, and now is again manifesting as a rule in a mild form. Its prevalence, however, cannot be said to have diminished. The variations it may show in different countries are well recognized—in India, for example, the disease is very rare. This may be accounted for to some extent by the different strains of its causative organisms.

Acute rheumatism is quoted as another disease whose manifestations have become noticeably less severe, although, as in the case of scarlatina, its prevalence has not lessened. We cannot speak with such certainty as to difference in its causal factor, and the suggestion has been made that the use of salicylates partially accounts for the infrequency of the acute and widespread arthritic symptoms. Smallpox is another disease which appears to have assumed a very mild form, although Sydenham, Jenner and others noted similarly mild epidemics. The disease as seen in Europe at present is so light in its manifestations as to arouse protests against the comparatively greater discomfort of vaccination. Some physicians regard this mild form as distinct from smallpox. Hence, in some countries the terms "alastrim" has been applied to the disease (a Brazilian word from the Portuguese *alastra* "something which burns like tinder, scatters, spreads from place to place"), or "kaffir-pox," "para-variola," etc. It serves to protect against smallpox, however, and in other respects is still to be regarded as such. As Sir Humphry points out, the employment of special terms such as these results in making it even more difficult than it is at present to insist upon the preventive measures of vaccination and isolation.

It is significant, also, that acute appendicitis has become much more common in the last 50 years. This may be regarded as an actual increase rather than as one due entirely to more careful clinical observation, and may be associated to a certain extent with a corresponding general increase in influenza in Great Britain. Chlorosis, a blood disease, whose declension even within the experience of the last generation has been so striking may be contrasted with a reported increase in pernicious (Addisonian) anæmia. Certain facts also go to show that urinary calculus in the eastern counties of England has become noticeably less.

To what may we ascribe such variations of aspect? Much no doubt is due to modern methods of treatment, both prophylactic and curative, but we realize only too well how far short this factor falls of being even mainly responsible. The question cannot be properly approached until we have an accepted theory of what disease is. The definition given by Adami,* for example, does not say what disease is, because it does not define health, but it at least makes it clear that two main factors are involved: there is the individual, or the host, on the one hand, and the agent, infective or what not, on the other; in other words, the soil and the seed. What an infinity of variety is possible on both sides! In Sir Humphry's words: "It would indeed be strange if diseases always remained the same, for a disease, as the late Sir Clifford Allbutt insisted, is not a fixed morbid entity, such as might perhaps be visualized by the entry of an evil spirit into a man, but the reaction of that complex organism the body to some infection or injurious influence."

* *Brit. M. J.*, Jan. 15, 1926.

* "Disease is a process or succession of disturbances induced by any agent which disturbs the normal activities of the organism as a whole or its constituent parts" (1910).

Consider some of the factors that may alter the state of the host. There is the fact that continued exposure to infection may cause a certain degree of immunity; this is directly suggested by such observations as that schools and institutions show a growing immunity to scarlet fever judging by the Dick and Schick tests; and that laboratory animals which survive an epidemic show an increased resistance. Indirectly supporting this conclusion is the notable severity of epidemics in isolated countries where the disease has not occurred to any extent previously, as was the case with measles in the Faroe Islands in 1781 and 1846; in Fiji and Rotuma, and the Shetlands: or as occurred with the common cold when first it appeared in St. Kilda. Other and perhaps more obvious factors may be changes in environment, an increase or diminution in alcoholism, improvement in character of the dietary, etc. Authorities differ as to whether the effect of these on the host is more important than a change in the pathogenicity of bacilli, but it is more reasonable to suppose that impaired resistance from malnutrition may play in some instances a more prominent part in favouring infection than does increased microbic virulence. For instance, there was the enormous increase in tuberculosis in Central Europe after the war which was significantly coincident with severe deficiency diseases.

Incidentally, it is interesting to note that in Russia where the hardships from starvation were most evident, scurvy was the least frequent of the deficiency diseases. This was largely due to the almost complete deprivation of ordinary food which drove the people to eat bark and leaves. Another feature of the deprivation was the diminution in disease dependent on excess. Russia and Germany both showed a fall in chronic alcoholism, adiposity and diabetes, with a very marked fall in gallstones and cholecystitis.

In these we have evident relationships of cause and effect. It is not so easy to explain the increase to-day of functional and organic nervous diseases, of diabetes, high blood pressure and arterio-sclerosis. One might be tempted to suggest, however, that if diabetes, especially, showed a decrease under conditions of enforced starvation (as already mentioned) there is the converse probability that its increase points to excess in eating. It must also be remembered that the actual increase of arterio-sclerosis, or high blood pressure, is open to debate. Arterio-sclerosis, Sir Humphry points out, was common in ancient Egypt, and the sphygmomanometer is of too recent introduction to allow of comparison with previous conditions of blood-pressure in other ages.

We have a little more definite knowledge regarding some of the changes that may occur in the seed, *e.g.*, bacteria. It is recognized that mutation may occur much more readily in the lower forms of life than in man, and many examples might be given of the modification of bacterial activity by environment, nutrient material, etc. We do not know, however, what makes a given bacterial form become more virulent: animal passage is not the only method by which this may be produced. A complicating factor is the presence of secondary infections; in scarlatina, for example, it is probable that it is these which give rise to its more virulent manifestations. Indirect evidence of such a change in virulence is to be gathered from the example of diphtheria, whose organism probably assumed its virulent aspect not very long before its first classical description by Bretonneau in 1821. Sir Humphry suggests that it is unlikely that so clear-cut a clinical condition should have been quite overlooked before this.

The soil and the seed, then, must be considered both separately and in combination. But so complex and multitudinous are the factors that may affect both or either that the task of coordinating our knowledge regarding them is coming to be more and more arduous. In this respect it is possible that our accumulation of knowledge may become so unwieldy that we shall not be able to disentangle from it any definite shape. We are making this accumulation by a process of analysis: it is necessary from time to time to pause and see what it is we wish to construct. It has been well said that "the last thing to be discovered in any science is what the science is really about. Men go on groping for centuries, guided merely by a dim instinct and a puzzled curiosity, till at last 'Some great truth is loosened.'"

H. E. MacDermot

WHAT IS FATIGUE?

IN the last quarterly number of the *Journal of Neurology* Dr. R. D. Gillespie, a Research scholar in mental diseases, writes on Fatigue. To the ordinary man fatigue is the result of sustained labour or exertion. It is physiological and involves nothing abnormal. The condition to which Dr. Gillespie specially refers is a fatigue syndrome to which some people give the name neurasthenia, and of which an important symptom is "irritable weakness." According to Dr. Gillespie, the cause of this fatigue syndrome may be sought in five directions. The first may be found in the constitution of some people who have congenitally a weakness of the nervous functioning power. The second is an auto-intoxication, due frequently to gastro-intestinal disturbances; but in some cases both the fatigue and the disturbance may have a common toxæmic origin. Overwork has been suggested as a third cause, but experimental production of prolonged weakness by work alone is lacking. Emotional causes should always be suspected. Dejerine writes that the real cause of the fatigue syndrome lies in the emotional equipment. Lastly, neurasthenic symptoms may develop as the result of sexual excess. The symptoms of the fatigue syndrome are brain fag, poor memory, lack of concentration, irritability of temper, increased reflexes, poor sleep, anorexia, and numerous aches and pains. Gillespie considers that the principal place in treatment must be assigned to psychotherapy. Graded exercises will increase tolerance and vital capacity. Hydrotherapy will improve vasomotor tone and some medicines may prolong and increase the working power of muscles.

RECURRENT IRITIS

RECURRENT iritis is now regarded by ophthalmologists as almost invariably due to metastases from a focal infection, and its radical cure as dependent on the removal of every possible focus. Two series of 100 cases each have been reported during past years to the American Medical Association by Drs. Irons and Brown, in which careful study of each patient was made to determine the different sources of infection. In a recent report they have summarized the first fifty cases in which they have been able to obtain reports with reference to the influence of this removal of possible foci of infection on the recurrence of the iritis. In forty-three of these there had been no recurrence after a period of observation of from three to twelve years. In seven recurrence had taken place. In this small group the recurrence had been ascribed to either syphilis, gonorrhœa or tubercle. Of other sources of infection, the prostate must always be remembered. An infection from this source is probably more frequently non-gonococcal than gonococcal. Another source of local infection suggested was intestinal infection by protozoa of various types. Effective treatment directed to the cure of this condition in a few cases had had, according to Dr. Mills of Los Angeles, encouraging results. The day is past when all cases of iritis were regarded as either syphilitic or rheumatic.

One hundred years ago in January, Longmans, Green & Co. (then known as Longmans & Company) contracted for Sir Walter Scott's eight-volume "Life of Napoleon." The advance paid by the publishers for the English rights alone amounted to 10,500 guineas, or about $52,500. The Scotch rights were contracted for separately. Modern authors who are inclined to think there was a small market for books a century ago may consider this. As to proceeds from sale, the first and second editions of the book earned for Sir Walter £18,000 (about $87,597)—a startling sum even in our own days of "unparalleled" interest in biography.

Editorial Comments

CAUSATION OF RHEUMATISM

In an article entitled, "The problems of rheumatism and rheumatic heart disease in children," contributed to the *Journal of State Medicine* for January, 1927, Reginald Miller sets forward statistics in support of his contention that "in the rheumatic infection of ehildren we have one of the great killing and disabling diseases of this country." He writes of the situation in England. The infection is curiously confined to the poorer classes although the very poor may be exempt; is especially prevalent during the winter months (those that are cold and damp), and is essentially a disease of school years. The disease is one of the towns, and especially of the industrial towns. It is rare in the pupils of private schools, where facilities are provided for drying wet clothing, but common in the state elementary schools which lack such provision. In Miller's estimation, the distribution of rheumatism in certain places and classes and families is to be explained by environmental conditions; which also predispose to the chronically infected tonsils found in perhaps 95 per cent of cases. Briefly, he considers dampness the most important factor, and thus gives support to the traditional association of rheumatism with dampness. This is not merely a matter of site, for at the noted schools (Eton and Beaumont) situated close to the Thames there is no rheumatism. It is the state of the house, as determined by the nature of the sub-soil and its relation to the house which matters. "Tonsillar disease . . . is common enough in every class, though doubtless the early removal of diseased tonsils in the upper classes tends to protect them from rheumatic infection. Urbanization and industrialization will not alone explain the class incidence of rheumatism. . . Poverty itself will not explain it, for why should the very poorest suffer less from it than the more prosperous of the labouring classes? Why does one artisan family get the disease rather than another? It is not a question here of financial conditions. I believe that the answer to our problem, the missing factor, is the influence of damp dwellings."

W. H. HATTIE

ON TOBACCO

In a recent number of the *Lancet*,* among the annotations the editor quotes from a paper by Dr. Leopold Bussy in the *Journal de Medicine de Lyon*, in which he disputes the old view that tobacco gives rise to a true amblyopia. He states that nicotine, like other toxins, may play a minor part, but toxic retrobulbar neuritis is always due to the abuse of alcohol. His description of the clinical picture agrees with that of Osler. The lesion is bilateral, and shows itself in a loss of capacity to distinguish first red and then green, and in a blurring of objects at the point of focus. The condition according to Dr. Bussy appears to be on the increase in France, and is attributed by him almost invariably to over-indulgence in alcohol. The fallacy as regards the action of tobacco he considers originated in ancient traditional statements. The type of the smoker and drinker has invaded the popular mind in a number of popular stories, and clinicians have been unable to free themselves from this teaching and have fallen into the error of allotting equal toxicity to both drugs. He holds English text-books responsible for the perpetuation of this fiction. Apart from the rejection of tobacco as the exciting cause of defective vision, the writer controverts the accepted ideas on the pathology of the lesion. Careful examination would indicate that this amblyopia is not due to any inflammation of the interstitial tissue, nor any damage to the vascular system of the optic nerve, but would appear to be due to a primary lesion of the ganglion cells of the macula. Thus the affection would appear to resemble the amblyopias due to male fern or quinine. The writer of the articles considers that the term retrobulbar neuritis should be replaced by the term alcoholic macular retinitis, a challenge which must be decided by ophthalmologists in the future.

* The *Lancet*, Oct. 16, 1926, p. 818.

THE SPAHLINGER TREATMENT OF TUBERCULOSIS

The Spahlinger treatment of tuberculosis must apparently still be regarded as a secret remedy, and experience thus far would indicate that it has by no means proved itself of great value. Dr. Thomas Nelson, physician to St. George's Hospital and Brompton Consumption Hospital, reports the records of ten patients injected by Spahlinger, personally, with this remedy between November, 1913, and November, 1914. In the case of these patients some had received as many as twenty-nine injections, and the majority had received more than twenty. Of these ten patients, eight had tuberculosis of the lungs, one tuberculosis of the spine and one lupus. At the end of ten years, only the patient with lupus and the one with tuberculosis of the spine are known to be alive. These forms of tuberculosis, however, are forms which are not specially fatal. One of those who had tuberculosis of the lungs cannot be traced. Of the remaining seven all are dead, two dying in the following year, one

living as late as 1921. Nelson writes, "that the evidence in favour of treating tuberculosis by this method is not sufficient at this time to warrant an extensive trial." Spahlinger should at least be able to show that in a considerable number of cases his remedy will accomplish more than can be accomplished by the method of treatment now practised in well regulated institutions. This, Dr. Nelson thinks, he has not yet done.

ENDEMIC TYPHUS IN ALABAMA

Kenneth F. Maxcy, of the United States Public Health Service, reports upon an Epidemiological Study of Endemic Typhus (Brill's Disease) in the South-eastern United States, in *Public Health Reports* for December 24, 1926. Although the disease is not limited to Alabama, his report deals with investigations made in that State. Its distribution is irregular, both as to locality and season, but is most prevalent in the southern portion of the State. It is indistinguishable clinically and serologically from Old World typhus, except for its mild clinical course and low fatality rate. But the louse apparently plays no part in its transmission. Of recent years a similar type of the disease has been reported from Australia and the Federated Malay States. In one Australian locality it appeared to be associated with a migration of mice and was at first called "mouse fever." In Alabama, Maxcy can not account for the persistence of the disease unless there is some reservoir of infection apart from humans, as scarcely more than a hundred cases had been detected in a period of four years. Such a reservoir may exist in rodents which are known to be susceptible to the virus of typhus. A large proportion of his cases occurred in tradesmen who handled foodstuffs, and he, therefore, suspects rats and mice more particularly, with fleas, mites, or possibly ticks as vectors of infection.

W. H. HATTIE

We have been greatly interested in following the developments in South African medical affairs. From the details published in our columns our readers will recall the steps which have been taken to establish a single association to replace the two separate medical bodies existing in South Africa. One does not have to read very closely between the lines to understand what difficulties had to be surmounted, and we extend our hearty congratulations to the medical profession of South Africa for the successful culmination of their efforts. The first evidence we have received of this happy event is in the form of the opening number of the *Journal of the Medical Association of South Africa* (*B.M.A.*), for the continued success of which we offer our most sincere good wishes.

We have received a communication from Dr. N. B. Gwyn to the effect that the University of Toronto created a chair of Medical History for Dr. J. T. Fotheringham some two years ago. This is to supplement the comment made in our columns of February by Dr. C. J. Tidmarsh on the History of Canadian Medicine.

How to make our forests more efficient is the aim of the novel investigations carried on in the Rocky Mountain Forest Experiment Station at Colorado Springs by C. G. Bates and J. Roeser. By growing seedlings of various kinds of evergreen trees on a table under the light of tungsten-filament blue-glass lamp for ten hours a day for nine months they determined the limit of light essential for the development of each kind of tree. They found that some species were five times more efficient than others at trapping the roving rays and utilizing their energy for construction purposes. The California redwood ranked first in efficiency as light-catcher for it could keep alive with less than four-fifths of 1 per cent full noon sunshine. Engelmann spruce and Douglas fir ranked next with one and a quarter per cent. Most of the pines require 2 to 3 per cent while the scrubby pinon of the Colorado foothills failed to flourish with even 13 per cent of sunlight intensity. This accounts for the phenomenal ability of the redwood and spruce to make rapid growth in shade of deep timberland and shows why they have outstripped many other trees in evolutionary development. He concludes: "Broadly speaking we cannot afford to give space in the forest to a species which is relatively inefficient in photosynthesis, unless it is producing a wood of exceptional technical value."—*Science Supplement*, Jan. 28, 1927.

The Therapeutic Value of Work.—Attention was called recently to the creation of work centres and of special colonies for the benefit of tuberculous persons, where such patients may get a new grip on life and find an opportunity of earning small wages by work done in the open air. A similar enterprise has been launched at The Hague, where Dr. Boland has undertaken to supply work for patients with nervous and psychic disturbances.

Men and Books

THE SECOND CHAPTER IN THE HISTORY OF PATHOLOGY

By A. G. Nicholls

Halifax, N.S.

In the early Greek days, tampering with the dead bodies of human beings was regarded as an impiety. Under the more or less enlightened rule of the Ptolemies in Egypt more latitude was permitted, and the professors in the great medical school of Alexandria became noted for their proficiency in anatomy. But prejudice was strong, and they, like Vesalius centuries later, were accused of performing human vivisections. In the Middle Ages, when the church monopolized all learning and controlled all studies, dissection of the human body was still generally frowned upon, and until the sixteenth century anatomy was decidedly the Cinderella of the medical curriculum in the mediæval university. It is true that in the ancient school at Salerno the faculty was enjoined to dissect the human body once in five years, but it is doubtful whether they could live up even to the possibilities of this meagre authorization. At Bologna, as a result of the powerful influence of Taddeo Alderotti, it is probable that an occasional *anatome,* as it was called, was held; later on, however, Mundinus popularized the study of the human body, using as subjects condemned criminals. Although there were many of these, dissections still must have been few, for we find recorded that in 1319 legal proceedings were taken against four medical students for body-snatching. Even as late as 1467, anatomy does not appear on the curriculum of studies pursued at the University of Pavia, or on that of Padua at about the same date.

As the leaven of the Renaissance began to work, and gained force, all this was changed. Scholars now began to break with authority, and increasingly desired to base their views on direct observation of the phenomena of nature. The first-fruits of this new conception was the *De Fabrica* of Vesalius, which appeared in 1543, an epoch-making work, in which the fundamental subject of anatomy is dealt with in an adequate manner, and on thoroughly modern lines.

The transition from normal to pathological anatomy is, of course, easy. Just when the human body was first examined for the specific purpose of detecting disease is not easy to say. Doubtless, a few of the grosser aberrations were detected by the earlier anatomists. Thus, Vesalius was one of the first to describe internal aneurysm. Pliny the Elder (Bk. xix, Chap. 5, Sec. 26.) has an interesting passage, which may be quoted in this connection. In a discussion on the use of radishes for "phthisicke", or ulcer of the lungs, he says: "Proofe whereof was found and seen in Egypt by occasion that the KK. there caused dead bodies to be cut up, and anatomies to be made, for to search out the maladies whereof men died." Stray observations could, no doubt, be unearthed from other authorities. The little work of Antonio Beniveni, published in 1507, the *De abditis nonnullis ac mirandis Morborum et Sanationum Causis,* is the first systematic attempt in modern literature to record autopsies made for the prime purpose of determining the cause of death. But from this time on the practice of opening dead bodies became more common. Francis Glisson of Cambridge (1597-1677) appears to have been familiar with the idea of systematically comparing the organs in a series of bodies, and noting the lesions that invariably accompanied a certain train of symptoms. Harvey, too, remarks that more was to be learned from the dissection of one person who had died from consumption than from the bodies of ten persons who had been hanged.

About this time appeared Theophilus Bonetus of Geneva, who did yeoman service in culling from the literature the records of the autopsies performed during the sixteenth and seventeenth centuries. The result is embodied in two ponderous folios, dedicated to Frederic Augustus, Prince of Würtemberg, which were printed at Geneva in 1679. This monumental work is entitled "*Sepulchretum: sive Anatomia Practica ex Cadaveribus Morbo denatis,*" and is the first systematic treatise on morbid anatomy. It consists of 1706 pages of text, besides the dedication, indices, the preface *ad lectorem,* and the usual complimentary epistles. The enormous industry and the wide scholarship of the author can only be appreciated by a first-hand inspection of his book. In every case his authority is given, with chapter and verse. No less than 469 authors are quoted, ranging from Hippocrates to his own time. We are pleased to note among them the names of the leaders of English medicine in the seventeenth century: Robert Boyle, Thomas Burnet, Walter Charleton, Francis Glisson, William Harvey, Nathaniel Highmore, Richard Hooke, Frederic Loss, Richard Lower, Sir Theodore de Mayerne, Thomas Wharton, Thomas Willis, besides others less known. Sydenham is not mentioned, naturally, as he could see no value in post-mortem examinations.

Little can be learned of Bonetus himself. He

was born in 1620 and died in 1689. As his work is dated "from our Musæum," and he conducted autopsies with other well-known medical men, it is probable that he was professor in the University of Geneva. That he was an outstanding man in his profession is evident from his associations, for he is described as physician to Henry, Duke of Longueville, and also is said to have been physician to the Prince of Neufchâtel. There was then, and still is, in this university a large library, founded by Bonnivard (the Prisoner of Chillon) in 1551. This fact would stand him in good stead in the enormous work of compilation; enormous truly, for his was not the day of medical journals, abstracts, retrospects, and *indices medici.* His facilities, however, must have been good, for we find him editing under the title of *Zodiacus Medico-gallicus,* a Latin continuation of a French medical periodical, *Nouvelles Découvertes sur toutes les Parties de la Médecine,* published by Nicolas de Blegny (Paris, 1679-1681), which is generally considered to be the first medical journal printed in the vernacular.

The *Sepulchretum* contains records of some 3750 autopsies: some of them dealt with in a line or two, others at considerable length. Owing to the particular systematic arrangement of the book, many of the cases are referred to more than once, under different headings. This, of course, tends to unwieldiness. There are, in addition, many notes on clinical and pathological points, and opinions on moot points, culled from many sources. The more important cases are freely annotated, and this adds greatly to the value of the observations. The whole is classified on the basis of symptoms and physical signs according to a definite plan. There are four books. Book 1 deals with *Affections of the Head;* Book 2, with *Affections of the Thorax;* Book 3, with *Affections of the Abdomen;* and Book 4 is on *Fevers, Swellings, Wounds, Ulcers, Dislocations, Fractures, Difficult Postures, Gout, the Arthritides, Sciatica, Lues Venerea, Plica Polonica, External Diseases, Chronic Diseases,* and *Miscellaneous Conditions.*

All the autopsies on various exalted and otherwise distinguished personages are here. Among these may be noted: Isaac Casaubon; Ernest, Archduke of Austria; Francis I, King of France; George, Landgrave of Hesse; Pope Gregory XI; Henry the Great, King of France; Henry III of France; Louis XIII, of France; the Emperor Ferdinand III; and Thomas Parr.

On taking a general survey of the collection, one is struck with the prevalence of wounds and other injuries, especially of the head, and also with the frequency of calculi. A few of the more interesting cases, taken somewhat at random, may be mentioned: several instances of pus discharged from the bowel are given, due to empyæma, abscess of the liver, utero-rectal fistula, and mesenteric abscess. There is a case of intestinal obstruction caused by a tumour of the uterus, weighing 87 pounds. Tubal gestation is referred to, in a work of Riolanus. What was probably echinococcus disease of the liver is recorded (Book iii, Sec. 16, Observ. 7). Also, there is a probable case of hyaloserositis, affecting the liver, spleen, intestines, uterus and bladder (Petrus Quentzius). Dermoid cysts of the ovary were found. Some large vesical calculi are noted. Velschius relates the case of Saubert, a librarian at Nuremberg, who had one removed which weighed ten ounces. Being a sympathetic man, he adds the following verses:

> "Quem cernis lapis hic, immensi causa doloris
> Faecunda et longi temporis una fuit.
> Dira infanda licet fuerint tormenta, valebant
> Mitem animam placidi vincere nulla viri
> Crescebat cruciatus atrox, patientia major
> Crescebat summi nutibus apta Dei."*

In another case a stone was found in the urinary bladder weighing 13 ounces (Ferrandus). For the credit of our race, it may be stated that England seems to hold the record for this sort of thing, with a stone weighing one pound and two drachms (Van Helmont). Several cases of pain in the stomach, due to concretions of uncertain nature are noted, as well as some caused by phytobezoar. In one case a large mass of aloes was found in the stomach: in another, a pound of ginger. Some very rare congenital anomalies of development are recorded, such as the absence of the pineal gland with hypoplasia of the cerebrum: complete absence of the pericardium: and the common bile duct discharging into the stomach.

Some interesting speculations are opened up. Thus, in a "*puella propter glandulas in toto corpore scirrhodes per atrophiam mortua,*" we are inclined to hazard the diagnosis of Hodgkin's disease. Again, in a girl of fourteen years, dying suddenly from extensive clotting of the blood in the aorta and vena cava, may this not have been a case of chlorosis? Among the curiosities, which we may, perhaps, accept with the proverbial "grain of salt", are several instances in which globules of metallic mercury were found in the cranium, and in the bones and joints, following inunction with this metal: also, two cases of spontaneous combustion in chronic alcoholics. Less questionable is the case in which vertigo was cured by the spontaneous discharge from the nose of a clear limpid fluid, no doubt cerebrospinal in deriva-

* A free rendering of this may be offered as follows: "This stone you here behold was the fruitful and persistent cause of excruciating pain. And yet, indescribable as those torments were, they could never conquer the gentle spirit of the steadfast victim. The cruel agony increased but with it grew his fortitude, worthy indeed of the mercy of the High God." (Ed.)

tion: and the case in which a barber-surgeon opened an aneurysm under the impression that it was an abscess, with disastrous results.

Brief references to some of the special autopsies may not be out of place. In the case of George, Landgrave of Hesse, who died of smallpox in 1675, an abscess was found in the right lung, with black spots (? petechiæ) in the left. The pleural sacs and abdomen contained blood. Variolous pustules were present on the chest and limbs, on the tongue and in the throat.

Henry the Great, King of France, was twice stabbed in the chest by a fanatic, Ravaillac. The upper wound was superficial. The lower one wounded the lung, and severed one of the pulmonary veins just above the left auricle. The thorax was full of blood.

Special interest attaches to the autopsy on Thomas Parr, the world's champion old man, who died in 1635, at the age of 152 years and 9 months. Parr was a poor countryman, well-developed, and robust, who had married a widow in his 120th year. Attracting much attention, he was taken by Thomas, Earl of Arundel and Surrey to his seat, where he shortly afterwards died.

The autopsy showed him to be well-developed and fleshy. The face was livid, as if he had suffered from some respiratory distress before he died. The lungs were congested and adherent to the ribs. His heart was large, firm, fibrous and fatty. The blood was dark-coloured. The costal cartilages were pliable and not calcified. What appear to have been retention cysts of some size were found in his kidneys, and this was adduced to account for the suppression of urine from which he suffered just before he died, though some attributed this symptom to the regurgitation of "serosity" to the lungs. The spleen was very small. All his other organs were found to be normal.

Parr had been accustomed to the simple life, subsisting on milk, whey, old cheese, and black bread. His eyesight was good until his 120th year. His hearing, and mentality were maintained, and he was able to perform his usual duties on the farm, even taking part in the threshing. His death is attributed by the great Harvey to his translation from his humble surroundings to the luxury and excitement of a great nobleman's house. Rich food and late hours proved his undoing.

The devotees of My Lady Nicotine were not regarded with the same complacency in the old days as they are now. Hear what Theodore Kerekring (*Observ. Anatom.*, xc.) has to say.

"A bad habit prevails in Europe of sucking the smoke of the herb Tobacco through tubes connected with it. To show in what degree one who indulges in it very often may injure his health, I submit to your attention the case of a man whom I sectioned before a concourse of physicians. Being addicted to immoderate indulgence in these smoky delights, he would undertake scarcely any business without inhaling this smoke, which was, as it appeared, fatal for him. For when Nature, as it were, belaboured him with frequent blows, he began to grow weak and fell ill, and he evacuated black material through every channel, until eventually he cast out also his dusky spirit.

"Assuredly, I visited and thoroughly explored the lodging which he had left, armed with my dissecting knife. Dost thou ask what I saw? It seemed to me that I entered the very abode of Pluto. Behold, within his jaws his tongue was swollen, being stained a dark colour, and saturated with what seemed to be a poisonous juice. What about his trachea? Like a chimney, everywhere covered with a black soot. The lungs dry and collapsed, almost friable. The liver, as if, more than the rest, it had attracted the fire, was quite inflamed, from the heat of which not even the bile in the gall-bladder was exempt, for it had changed from a brownish colour to a green. In the intestines, moreover, like ballast in the body, were the ashes of the whole conflagration, for they were full of black material, which emitted an odour not more agreeable than Avernus itself. Here are the rewards of this frequent sucking."

Th. Bartholini gives evidence to the same effect, and G. Hofmann quotes King James I of England as saying (probably in his "Counterblast against Tobacco") that those who indulge in this folly suffer from incurable disease of the chest, with delirium, insomnia, and convulsions. After death the lungs of such persons are found to be black and shrivelled, as if indurated with smoke. We gather from Bonetus' work that even in his time tobacco was chewed and snuffed, as well as smoked.

Bonetus has been criticized for admitting to his work the observations of other men, without assuring their genuineness, and on the grounds that his book is diffuse, inaccurate, and misleading. Every man should be judged by the standards of the time in which he lived, and, looking at the matter in this way, Bonetus was actually less credulous than his contemporaries. His language and his modes of thought are those of his day and of course, many ideas seem peculiar to us. Diabetes is synonymous with polyuria and thirst; the spleen bulks too largely in the philosophy of disease; doubtless, a Galenical tradition. Melancholy is attributed to the most diverse causes, such as, aneurysm, black blood in the cavity of the heart, total synechia of the pericardium, scirrhus of the pylorus, congestion, fibrosis and atrophy of the spleen. Its seat is placed in the uterus, in the spermatic veins ,and in the cœliac and mesenteric vessels. Yet Bonetus is fair-minded. He gives opinions *pro* and *con*, and quotes

Glisson, Sylvius, and Highmore as being against the theory of the spleen being a factor in this affection. Furthermore, Bonetus is up-to-date, for he is familiar with the work of the English school of experimentalists, at that time easily supreme, and quotes at length Willis on the nervous system, Lower on the circulation, and Hooke on respiration. The classification adopted, *viz.*, the grouping of the cases according to symptoms and physical signs, while it leads to much repetition and undoubted diffuseness, and is unscientific from the modern standpoint inasmuch as it brings unlike things together, is excellent for the time. Its defects are largely compensated by an index of the diseases and morbid conditions dealt with. Even now it would be useful to the diagnostician. The *Sepulchretum* had a great vogue for at least a hundred years. It has been said of it that in it could be found all the medical lore that a student could require. The renowned Haller speaks of it as "an immortal work, which may in itself serve for a pathological library." With this dictum we may easily agree to-day. Anyone having sufficient leisure and Latinity will find here a mine of interesting and improving information.

MORTON AND ETHER (1846)*

"Twilight came on. The hour had long passed when it was usual for patients to call. I had just resolved to inhale the ether again and have a tooth extracted under its influence, when a feeble ring was heard at the door. Making a motion to one of my assistants who started to answer the bell, I hastened myself to the door, where I found a man with his face bound up, who seemed to be suffering extremely. 'Doctor,' said he, 'I have a dreadful tooth, but it is so sore I cannot summon courage to have it pulled; can't you mesmerize me?' I need not say that my heart bounded at this question, and that I found it difficult to control my feelings, but putting a great constraint upon myself I expressed my sympathy, and invited him to walk into the office. I examined the tooth, and in the most encouraging manner told the poor sufferer that I had something better than mesmerism, by means of which I could take out his tooth, without giving him pain. He gladly consented, and saturating my handkerchief with ether I gave it to him to inhale. He became unconscious almost immediately. It was dark, Dr. Hayden held the lamp. My assistants were trembling with excitement, apprehending the usual prolonged scream from the patient, while I extracted the firmly-rooted bicuspid tooth. I was so much agitated that I came near throwing the instrument out of the window. But now came a terrible reaction. The wrenching of the tooth had failed to rouse him in the slightest degree; he remained still and motionless as if already in the embrace of death. The terrible thought flashed through my mind that he might be dead—that in my zeal to test my new theory, I might have gone too far, and sacrificed a human life. I trembled under the sense of my responsibility to my Maker, and to my fellow-men. I seized a glass of water and dashed it in the man's face. The result proved most happy. He recovered in a minute, and knew nothing of what had occurred. Seeing us all stand around he appeared bewildered. I instantly, in as calm a tone as I could command, asked, "Are you ready to have your tooth extracted?" "Yes," he answered, in a hesitating voice. "It is all over," I said, pointing to the decayed tooth on the floor. "No," he shouted, leaping from his chair. The name of the man who thus for the first time underwent an operation under anæsthesia induced by ether was Eben Frost."

H. C. JAMIESON

* Sir James Simpson, by H. Laing Gordon, Masters of Medicine Series, Unwins, London, p. 99.

AN INTERESTING LETTER

Boston, November 21, 1846.

My dear Sir: Everybody wants to have a hand in a great discovery. All I will do is to give you a hint or two, as to names or the names to be applied to the state produced and the agent.

The state should, I think, be called "Anæsthesia." This signifies insensibility, more particularly (as used by Linnæus and Cullen) to objects of touch. (See Good, *Nosology*, p. 259). The adjective will be "Anæsthetic." Thus we might say, the state of anæsthesia or the anæsthetic state. The means employed would be properly called anti-æsthetic agent. Perhaps it might be allowable to say anæsthetic agent, but this admits question.

The words antineuric, neuro-leptic, neuro-lepsic, neuro-etasis, etc., seem too anatomical; whereas the change is a physiological one. I throw them out for consideration.

I would have a name pretty soon, and consult some accomplished scholar, such as President Everett or Dr. Bigelow, senior, before fixing upon the terms, which will be repeated by the tongues of every civilized race of mankind. You could mention these words which I suggest for their consideration; but there may be others more appropriate and agreeable.

Yours respectfully,

O. W. HOLMES.

To Dr. W. T. G. Morton.

* Epoch making contributions to *Medicine & Surgery*, Camac., p. 511.

Association Notes

PRELIMINARY PROGRAMME FOR THE FIFTY-EIGHTH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION TO BE HELD IN TORONTO ON JUNE 13, 14, 15, 16, 17, 18, 1927

In Conjunction With

The Ontario Medical Association
The Canadian Public Health Association
The Canadian Tuberculosis Association
The Canadian Society of Anæsthetists
The Canadian Radiological Society
The Ontario Radiological Society

HEADQUARTERS—THE UNIVERSITY BUILDINGS

Registration will commence at nine o'clock on the morning of Monday, June 13th, in the Exhibition Hall, University College, and will continue throughout the week.

The first two and one half days of the week are devoted to the Business Sessions of the various Associations. The Scientific Programme commences with the afternoon session of Wednesday, June 15th.

An examination of the programme herewith presented, will disclose the fact that talent of a very high order has been secured for the meetings.

Particular attention is directed to the announcements from the various Committees, all having to deal with the general arrangements for the meeting, looking to the comfort and happiness of the members and their friends.

SKELETON PROGRAMME

Monday, June 13th

10.00 a.m.—Meeting of Canadian Medical Association Council.
1.00 p.m.—Adjournment for luncheon, as guests of the President-elect, Dr. F. N. G. Starr.
2.15 p.m.—Meeting of Council.
7.00 p.m.—Council will be dinner guests of the Academy of Medicine, Toronto.

Tuesday, June 14th

9.00 a.m.—Meeting of Canadian Medical Association Council.
1.00 p.m.—Adjournment for luncheon, as guests of the Chairman of Council, Dr. A. Primrose.
2.00 p.m.—Meeting of the Committee on General Purposes of the Ontario Medical Association.
7.00 p.m.—The Ontario Medical Association annual dinner and round table evening; guests—the members of the Canadian Medical Association Council. The programme will be in charge of the Committee on Inter-Relations of the Ontario Medical Association.

Wednesday, June 15th

9.00 a.m.—Meeting of Canadian Medical Association Council.
9.00 a.m.—Clinics will be arranged in the various hospitals (See Bulletin Boards.)
1.00 p.m.—Luncheon, and formal opening of the convention.
2.00 p.m.—General Session in Convocation Hall.
4.30 p.m.—Garden Party at Government House, Chorley Park, guests of His Honour the Lieutenant-Governor of Ontario, and Mrs. Wm. Donald Ross.
7.45 p.m.—The annual Dinner Dance—Hart House.

Thursday, June 16th

9.00 a.m.—Sectional meetings.
2.00 p.m.—General Session—Convocation Hall.
4.30 p.m.—Garden Party at "Donalda," and inspection of Model Farm, guests of Mrs. D. A. Dunlap.
Thursday night—Alumni Dinners and Class Reunions.

Friday, June 17th

9.00 a.m.—Sectional meetings.
2.00 p.m.—General Session—Convocation Hall.
4.30 p.m.—Visit to the School of Hygiene and Connaught Laboratories, followed by a motor trip to the University Farm.
8.00 p.m.—Second Listerian Oration, delivered by Sir Charles Scott Sherrington, G.B.E., M.D., D.Sc., F.R.C.P., LL.D.

Saturday, June 18th

9.00 a.m.—The various Sections are arranging clinics, ward rounds, etc., in the several hospitals, at which distinguished visitors will take part.

XUM

GENERAL SESSIONS

Place of Meeting—Convocation Hall

Wednesday, June 15th

2.00 p.m.

Lesions of the arteries of the extremities.
Dr. Dean Lewis, Johns Hopkins University.
Post-partum care.
Dr. B. P. Watson, New York.
Eczema in infants and children.
Dr. C. G. Kerley, New York.
Septic infections of the bronchi.
Dr. D. A. Stewart, Ninette
Maternal mortality.
Dr. Helen MacMurchy, Ottawa.

Thursday, June 16th

2.00 p.m.

Otolaryngology and the general practitioner.
Dr. G. E. Shambaugh, Chicago.
Mr. H. S. Souttar, C.B.E., F.R.C.S.
Surgeon to the London Hospital.
(Title to be announced later)
The myocardium.
Dr. J. Strickland Goodall, London, England.
Primary tumours of the lung.
Dr. Oskar Klotz, Toronto.
Neoplasms in the lung.
Dr. W. A. Evans, Detroit.

Friday, June 17th

2.00 p.m.

Paget's disease of the nipple.
Sir G. Lenthal Cheatle, K.C.B., F.R.C.S., King's College Hospital, London, England.
Symposium on the gall bladder.
Pathology —Dr. Wm. Boyd, Winnipeg.
Radiology —Dr. Everts Graham, St. Louis.
Medicine —Dr. Thomas McCrae, Philadelphia.
Anæsthesia—Dr. Wesley Bourne, Montreal.
Surgery —Dr. Charles Gordon Heyd, New York.
The interpretation of neurological findings.
Dr. Frederic Brodie, Vancouver.

PROGRAMME FOR SECTIONAL MEETINGS

Section of Anæsthesia of the Canadian Medical Association, meeting with the Canadian Society of Anæsthetists

Wednesday, June 15th

9.00 a.m.—Address of Welcome.
Dr. A. J. MacKenzie, President of the Academy of Medicine, Toronto.
Presidential address.
Dr. D. D. Freeze, Vancouver.
Indications for intratracheal anæsthesia.
Dr. C. C. Stewart, Montreal.
Post-anæsthetic anoxemias.
Dr. John H. Evans, Buffalo.
Effect of anæsthetics on the body as a whole.
Dr. Wm. Webster, Winnipeg.

2.00 p.m.—To be held at Department of Pharmacology.
Anæsthesia in thyroid surgery.
Dr. Thomas Hanley, Toronto.
Demonstration by
Dr. W. Easson Brown, Toronto.
Post-operative acidosis in children.
Dr. Charles Robson, Toronto.

Thursday, June 16th

9.00 a.m.—Hospital clinics—Demonstration of various types of anæsthesia.
(A Bulletin of operations and types of anæsthesia to be demonstrated, will be issued).

2.00 p.m.—Dr. A. L. Fleming, Bristol, England.
(Title to be announced on final programme).
Consumption of oxygen in health, disease and anæsthesia.
Professor Allan Rowe, Boston.
The surgeon and the anæsthetist.
Professor A. Primrose, Toronto.
The chemical basis of the efficiency and toxicity of local anæsthetics.
Dr. John S. Lundy, Mayo Clinic, and Arnold Osterberg, Ph.D., Department of Bio-chemistry, Mayo Clinic.

Friday, June 17th

9.00 a.m.—Carbon dioxide—its place in anæsthetic technique.
Dr. R. M. Waters, Kansas City.
The application of gaseous anæsthetics in unusual types of operations and in patients with unusual complications.
Dr. E. I. McKesson, Toledo.
Studies in the intoxication of ether, nitrous-oxide, acetylene, propylene, ethylene, and chloroform anæsthesia.
Professor V. E. Henderson, Toronto.
Résumé of anæsthesia.
Dr. F. H. McMechan, Avon Lake, Ohio.

2.00 p.m.—Combined meeting with the Canadian Medical Association.
Symposium on the Gall Bladder.
Dr. Wesley Bourne, Montreal, will deal with the subject from the view point of the anæsthetist.

Saturday, June 18th

9.00 a.m.—Demonstrations of various types of anæsthesia at the hospitals. Bulletin will give definite information.

EYE, EAR, NOSE AND THROAT SECTION

Thursday, June 16th

9.00 a.m.—Methyl alcohol amblyopia.
Dr. Alex. Macdonald, Toronto.
High lights in the progress of ophthalmology during the last twenty-five years.
Dr. George S. Derby, Boston.
Discussion on "The inter-relationship between pathological conditions of the eye, and the nose and throat, embracing headaches, focal infections and acute swellings of the eyelids."
(Different aspects of the above will be the subject of short talks by selected speakers).
Discussion opened by
Dr. G. E. Schambaugh, Chicago.
Hearing and its preservation.
A short paper will be presented, and the discussion will be opened by
Dr. G. E. Schambaugh, Chicago.
12.30 p.m.—Luncheon—The out of town specialists in Eye, Ear, Nose and Throat, will be the guests of the Toronto specialists.

Friday, June 17th

9.00 a.m.—Demonstration of interesting clinical cases. (Croft Room).
(A limited number of interesting clinical cases, with properly worked up histories will be seated in specially arranged booths in a room alongside the lecture room).
10.30 a.m.—Tuberculosis of the upper respiratory tract.
Dr. R. S. Pentecost, Toronto.
11.00 a.m.—Discussion on Dr. Pentecost's paper and on the clinical cases.

SECTION OF MEDICINE

Thursday, June 16th

9.00 a.m.—Eczema.
Dr. Harold Orr, Edmonton.
Certain distinct types of renal disease and their treatment.
Dr. Norman M. Keith, Rochester, Minn.
Blood chemistry in general practice.
Dr. E. H. Mason, Montreal.
The spleen in health and disease.
Dr. Edward B. Krumbhaar, Philadelphia, Pa.
The goitre heart.
Dr. John Oille, Toronto.

Friday, June 17th

9.00 a.m.—Acute rheumatic fever.
Dr. A. H. Gordon, Montreal.
The management of chronic arthritis.
Dr. George C. Hale, London, Ont.
Duodenal ulcer.
Dr. C. S. McVicar, Rochester, Minn.
Asthma.
Dr. W. T. Connell, Kingston.
Angina pectoris.
Dr. G. R. Brow, Montreal.

Dr. Thomas McCrae, Dr. C. F. Martin and other prominent speakers will take part in the clinics to be held in the various hospitals on Saturday morning.

SECTION OF OBSTETRICS AND GYNÆCOLOGY

Thursday, June 16th

9.00 a.m.—Hæmorrhage in pregnancy.
Dr. John D. McQueen, Winnipeg.
Pyelitis in pregnancy.
Dr. L. C. Conn, Edmonton
Pelvic inflammation.
Dr. J. S. McEachern, Calgary.
Nephritis in pregnancy.
Professor V. J. Harding, Toronto.
Description and Demonstration of Kieland Forceps.
Dr. W. R. Patterson, Toronto.

Friday, June 17th

9.00 a.m.—Fibroids.
Dr. F. B. Mowbray, Hamilton.
Management of certain obstetrical emergencies.
Dr. W. P. Tew, London.
Abortion.
Dr. Herbert Little, Montreal.
Ectopic gestation.
Dr. John Fraser, Montreal.
Pre-natal care.
Dr. J. W. Duncan, Montreal.
Prolapsus uteri.
Dr. George Hooper, Ottawa.

XUM

SECTION OF PATHOLOGY AND BACTERIOLOGY

Thursday, June 16th

10.00 a.m.

PATHOLOGICAL LABORATORIES—275 UNIVERSITY AVENUE

The section of Pathology will hold its meeting this morning from 10 a.m. to 1 p.m., in the Pathological Laboratories of the University of Toronto, 275 University Avenue, South-west corner of Toronto General Hospital grounds.

Half-hour talks with demonstrations of pathological material will be given on the clinical subjects outlined below. These presentations will be made as practical and as interesting as possible, and their application to the problems of the general practitioner emphasized.

Each demonstration will be given twice in the morning, at the times specified. Members will have to choose the demonstrations preferred, as it will be impossible to attend them all.

At 10 a.m. and again at 11.30 a.m.

HAY FEVER—Dr. H. K. Detweiler.
"A brief discussion on etiology, methods of laboratory diagnosis and treatment."
Room No. 45

LEUKÆMIA—Drs. G. W. Lougheed and E. S. Jeffrey.
"A brief talk on the subject of leukæmia, with the presentation of a series of blood smears from interesting cases."
Room No. 29

DIABETES—Dr. Noble Sharp.
"A clinico-pathological discussion with a laboratory demonstration of methods for estimating the sugar content of blood and urine."
Room No. 29

TUBERCULOSIS—Dr. I. H. Erb.
"A discussion of the pathology of tuberculosis in children with the presentation of some interesting pathological material."
Room No. 19

ENDOMETRIOSIS—Dr. J. W. Shirer.
"A discussion of dysmenorrhæ, etc., and its relation to the implants of endometrial tissue in the pelvic cavity."
Room No. 29

OTO-LARYNGOLOGICAL ABNORMALITIES—Dr. D. E. S. Wishart (10 a.m. only).
"A very interesting series of specimens will be shown illustrating various pathological conditions of the ear, nose and throat."
Room No. 10

At 10.30 and again at 12 a.m.

VOMITING OF PREGNANCY—Prof. V. J. Harding.
"Some factors in its causation: A demonstration of the laboratory control of treatment."
Room No. 19

INFECTIOUS JAUNDICE—Dr. Gordon Cameron.
"A résumé of the clinical features of this disease with a demonstration of its relation to endemic leptospira infection in rats."
Room No. 38

LEAD POISONING—Dr. George Laughlen.
"A brief discussion on the symptomatology and treatment with a demonstration of blood smears from typical cases."
Room No. 29

BOVINE TUBERCULOSIS—Dr. R. M. P. Price.
"A discussion of the bovine types of infection in animals and their relationship to humans with a demonstration of experimental production of bovine tuberculosis in animals."
Room No. 33

EXPERIMENTAL TUMOUR PRODUCTION—Drs. W. B. Brebner and A. W. M. White.
"An outline of some recent work on the etiology of cancer with a demonstration of the experimental production of tumour growth in animals."
Room No. 32

At 11 a.m. and again at 12.30 a.m.

JAUNDICE—Dr. Wm. Magner.
"A discussion of the significance of jaundice with a demonstration of laboratory methods employed in its investigation."
Room No. 19

FOCAL INFECTIONS—Prof. W. L. Holman.
"What is meant by focal infection, its significance and importance in general practice and a demonstration of the bacteriology with resultant lesions in human cases."
Room No. 38

METABOLISM—Dr. W. R. Campbell.
"A brief outline as to what is meant by basal metabolic rate and the significance of a rise or lowering of this rate: The principles underlying the estimation of the basal metabolic rate will be given."
Room No. 41

FRACTURES—Dr. J. E. Bates.
"A very interesting series of slides will be shown illustrating the successive changes occurring in the healing of a fracture."
Room No. 29

TUMOURS OF THE EYE—Dr. Alexander MacDonald
"Diagnosis and treatment of tumours of the eye with a demonstration of various interesting types of tumours found in the orbit."
Room No. 10

The Pathological Museum in this building will be open each day, from 9 a.m. to 5 p.m., to visiting physicians.

The pathological laboratories will also be open for inspection of routine work in pathology, bacteriology, serology, and chemistry.

SECTION OF PÆDIATRICS

Theatre Clinic—Hospital for Sick Children
By the Following Members of the Staff

Wednesday, June 15th

9.00 a.m.—Treatment of eczema in infants.
Dr. G. E. Smith.

Quartz light therapy in pædiatrics—Treatment of rickets.
Dr. F. F. Tisdall.

Intravenous and interstitial therapy.
Dr. A. P. Hart.

Management of heart disease.
Dr. G. R. Pirie.

Management of diabetes.
Dr. Gladys Boyd.

Management of nephritis.
Dr. Gladys Boyd.

Management of marasmus or atrophy.
Dr. Alan Canfield.

Management of promaturity.
Dr. R. Simpson.

Management of malnutrition in older children.
Dr. G. A. Davis.

Treatment and prognosis of scarlet fever and diphtheria in private practice.
Dr. B. Hannah.

Diagnosis, prognosis and treatment of acute poliomyelitis.
Dr. G. Boyer.

Goitre.
Dr. M. A. Cox.

A general synopsis of each case or condition presented will be given to each member attending the clinic along with a brief résumé of the chief recent advances in each instance.

Thursday, June 16th

9.00 a.m.—Diagnosis and treatment of enlarged thymus.
Dr. Howard Spohn, Vancouver.

Management of acute respiratory infections other than pneumonias.
Dr. Douglas Leitch, Edmonton.

Feeding problems in private practice.
Dr. Alton Goldbloom, Montreal.

Treatment of whooping cough.
Dr. R. R. Struthers, Montreal.

Acidosis and ketosis in children, practical consideration of.
Dr. Graham Ross, Montreal.

Results of the newer method of scarlet fever therapy.
Dr. H. B. Cushing, Montreal.

Intestinal grippe (so-called).
Dr. F. H. Boone, Hamilton.

Weaning problems.
Dr. Oswald Day, Winnipeg.

SECTION OF PUBLIC HEALTH

Thursday, June 16th

9.00 a.m.—Types of clinical reactions following the injection of biological products.
Dr. A. H. W. Caulfeild, Toronto.

Some aspects of physiological hygiene.
Dr. C. H. Best, Toronto.

Newer developments in the control of narcotic drugs.
Dr. J. A. Amyot, Ottawa.

Immunization against diphtheria.
Dr. F. Adams, Windsor.

The medical and legal aspects of drug addiction.
Dr. A. R. Richards, Burwash.

Periodic health examinations.
Dr. A. Grant Fleming, Montreal.

Contributions to preliminary programme of Canadian Medical Association Annual Meeting, 1927—by Canadian Public Health Association and Public Health Section of Canadian Medical Association.

Tuesday, June 14th

2.15–4.30 p.m.—Public Health Nurses' Section, Canadian Public Health Association.
Physics Building, University of Toronto.

8.30 p.m.—Annual Meeting, Canadian Public Health Association.
Physics Building, University of Toronto.

Wednesday, June 15th

9.00 a.m.–12 noon—Public Health Nurses' Section, Canadian Public Health Association.
Physics Building, University of Toronto.

XUM

SECTION OF RADIOLOGY

Thursday, June 16th

9.00 a.m.—Duodenal diverticula.
Dr. W. J. Cryderman, Toronto.
Radiological diagnosis of appendiceal disease.
Dr. W. H. McGuffin, Calgary.
Technique and results of cholecystography by the intravenous method—report of 160 cases operated upon.
Dr. James T. Case, Battle Creek, Mich.
The relation of sinus infections to respiratory diseases.
Dr. R. W. Knight, Brantford.
Paper—title to be announced later.
Dr. B. R. Mooney, Edmonton.
Roentgen-ray studies of dust inhalation.
Dr. C. R. Brink, Toronto
A case of recurrent sarcoma.
Dr. W. A. Wilkins, Montreal.
12.30–1.00 p.m.—Discussion.

Friday, June 17th

9.00 a.m.—Paper—title to be announced later.
Dr. R. Proctor, Edmonton.
The newer methods of treating asthma.
Dr. S. Gilbert Scott, London, Eng.
The treatment of rodent ulcer—Analysis of cases treated from 1906 to 1926.
Dr. A. Howard Pirie, Montreal.
Investigations and conclusions in physical therapy.
Dr. L. K. Poyntz, Chicago.
Investigation of chest diseases by means of lipiodol.
Dr. L. R. Hess, Hamilton.
Some unusual diseases of the colon.
Dr. W. H. Dickson, Toronto.
Researches regarding the interpretation of the lesions in pulmonary tuberculosis as seen in x-ray films.
Dr. P. M. Andrus, London.
12.30–1.00 p.m.—Discussion.

SECTION OF SURGERY

Wednesday, June 15th

9.00 a.m.—Operations in all Toronto hospitals. (See Bulletin Boards).

Thursday, June 16th

9.00 a.m.—Obstructive lesions of the gastro-intestinal tract.
Dr. A. J. Grant, London, Ont.
Splenomegaly with report of two cases.
Dr. G. A. B. Addy, St. John.
Foot ball injuries to the knee joint.
Dr. L. J. Austin, Kingston, and Dr. D. M. Campbell, Kingston.
Mechanical factors in infection of the renal pelvis and tubules.
Dr. D. W. MacKenzie, Montreal.
Some aspects of the problem of joint tuberculosis.
Dr. Russell A. Hibbs, New York.
Carcinoma of the colon—with case reports.
Dr. J. W. Thomson, Vancouver.

Friday, June 17th

9.00 a.m.—Mobility of the large bowel and its influence on health.
Dr. Andrew Croll, Saskatoon.
Post operative ileus.
Dr. John A. Gunn, Winnipeg.
Thyroid.
Dr. E. M. Eberts, Montreal.
Disabilities of the shoulder region.
Dr. Alex. Gibson, Winnipeg.
Immediate and end results of supra-pubic prostatectomy — Technique and pre and post operative care.
Dr. Verne G. Hunt, Mayo Clinic, Rochester, Minn.
Dr. J. G. MacDougall, Halifax.
(Subject to be announced later).

Saturday, June 18th

9.00 a.m.—Clinics and demonstrations in general surgery, orthopaedics and genito-urinary surgery, at the following hospitals:
St. Michael's Hospital.
Toronto General Hospital.
Hospital for Sick Children.
Grace Hospital and Toronto Western Hospital.

These clinics and demonstrations will be in charge of the staff of the respective hospitals. It is proposed to invite one or two visiting surgeons to be present at each of the hospitals to take part in the demonstrations and discussions.

GOLF

The Golf Section of the Committee on Arrangements is pleased to announce that a tournament has been arranged to take place on Tuesday, June 14th. Plans have also been completed whereby visiting golfers may play on the various courses. This year an artistic silver trophy in the form of a challenge cup, to be played for annually at the meetings of the Canadian Medical Association, has been generously presented by the Ontario Medical Association. Other prizes will also be presented. It is hoped that every golfing member will arrange to be present on June 14th in time to compete for the cup. Detailed instructions will be furnished later, by circular, to all members of the Association.

HOUSING

The Committee on Housing have made arrangements for two types of accommodation for guests attending the Fifty-Eighth Annual Meeting. The University of Toronto with its affiliated colleges has placed its residence accommodation at the disposal of the Association. In addition to this, limited hotel accommodation will be available. With reference to this latter type, the leading hotels are unable to promise to reserve single rooms during this session. Therefore, the hotel reservations must be for double rooms in the majority of instances.

The University residences which will be at our disposal will be the "Men's Residences" on Hoskin Avenue, the Residence, 73 St. George Street, and if needed, Trinity House and Burwash Hall. These will afford ample accommodation and will satisfy the requirements for single rooms.

Physicians accompanied by their wives, and lady physicians, may be accommodated in the residence of St. Hilda's College in St. George Street.

The Warden of Hart House has consented to serve breakfast to the guests at a reasonable charge during the session. The charges for accommodation are shown in the following list:

UNIVERSITY OF TORONTO RESIDENCES:	
1 to 4 days	$5.00
Each additional day	$1.00
KING EDWARD HOTEL:	
*Single Room	$4.00
Double Room with Bath	7.00
PRINCE GEORGE HOTEL:	
Double Room with running water	$3.00
Room with Bath	$4.00 to $6.00
WAVERLEY HOTEL:	
*Single Room with running water	$2.00 to $2.50
*Single Room with Bath	$2.50 to $4.00
Double Room with running water	$3.50 to $4.00
Double Room with Bath	$4.00 to $7.00
QUEEN'S HOTEL:	
*Single Room	$2.00 to $3.00
Double Room	$4.00 to $5.00
*Single Room with Bath	$3.00 to $4.50
Double Room with Bath	$5.50 to $7.00

*A very limited number of single rooms will be available.

It is requested that prospective guests make known their requirements by writing at an early date to Dr. Gordon S. Foulds, Secretary of the Housing Committee of the Association, at its offices, 184 College Street, Toronto 2, Ontario. The desirability of accommodation in the University Residences is obvious on account of the proximity of these buildings to the meeting places of the Association on the University Campus and the sociability found in this type of arrangement.

LADIES' PROGRAMME (Tentative)

Executive Committee

General Convener - MRS. F. N. G. STARR
Honorary Secretary - MRS. F. C. TREBILCOCK
Honorary Treasurer - MRS. W. B. HENDRY

Mrs. A. Primrose, Convener of Registration and Reception.
Mrs. C. H. Hair, Convener of Dinner.
Mrs. D. E. Robertson, Convener of Transportation.
Mrs. W. E. Gallie, Convener of Sports.
Mrs. V. E. Henderson, Convener of Evening Entertainment.
Mrs. Edgar Brandon, Representative of Ontario Medical Association.
Mrs. A. J. MacKenzie, Representative of Academy of Medicine.
Mrs. J. G. Fitzgerald, Mrs. T. C. Routley, Mrs. George S. Young, Mrs. Gordon Bates, Dr. Florence McConney.

Tuesday, June 14th

1.00 p.m.—Luncheon at the Granite Club for the wives of the visiting members of the Canadian Medical Association Council, the wives of the visiting members of the Directorate of the Ontario Medical Association, guests of Mrs. F. N. G. Starr.

3.30 p.m.—Through the courtesy of Mr. A. E. Mathews, visiting ladies will be entertained on his yacht to a trip on Lake Ontario.

8.30 p.m.—Musicale at "Wymilwood," 84 Queen's Park, for the visiting ladies, guests of Mrs. A. Primrose.

Wednesday, June 15th

4.30–6.00 p.m.—Entire Convention to be the guests at a Garden Party, of His Honour, the Lieutenant-Governor of Ontario, and Mrs. William Donald Ross, at Government House, Chorley Park.

7.45 p.m.—Annual Dinner and Dance—Hart House.

Thursday, June 16th

2.45 p.m.—Drive around the city for visiting ladies, concluding with a

4.30 p.m.—Garden party at "Donalda Farm"—the entire Convention to be guests of Mrs. D. A. Dunlap.

8.00 p.m.—Entertainment for visiting ladies—to be announced later.

Friday, June 17th

10.30 a.m.—Golf tournament at Lambton Golf Course, followed by luncheon,—guests of Ladies' Golf Committee.

4.15 p.m.—Drive to University Farm, transportation and afternoon tea, for the entire Convention, guests of Connaught Laboratories.

8.00 p.m.—Second Listerian Oration, delivered by Sir Charles Scott Sherrington, G.B.E., M.D., D.Sc., F.R.C.P., LL.D.

Swimming, shopping tours, visits to the Royal Ontario Museum, the I.O.D.E. Preventorium, the Art Gallery, etc., form part of the busy and interesting hours which await our visiting ladies, details of which will be published later.

It is urgently requested that all visitors to the Convention (men and women) register immediately upon their arrival in Toronto in the Exhibition Hall, University College, University of Toronto. Members of the Ladies' Registration Committee will be present in the Ladies' Registration Room to distribute Convention badges, to the wives of all members of the Convention, at the time of registration, to give information about the Convention Programme and to arrange for golf, swimming, shopping, etc. It is desirable that members and their wives indicate to the Registration Committee, as early as possible, the social functions they will be able to attend—admission to these functions to be by the Convention badge.

COMMITTEE IN CHARGE OF THE ANNUAL MEETING

CHAIRMAN - - - - - - - - - - DR. F. N. G. STARR
VICE-CHAIRMAN - - - - - - - - DR. EDGAR BRANDON
SECRETARY - - - - - - - - - - DR. T. C. ROUTLEY

SECTIONS

ANÆSTHETISTS
Chairman—Dr. Samuel Johnston
Secretary—Dr. W. J. Defries

EYE, EAR, NOSE AND THROAT
Chairman—Dr. W. H. Lowry
Secretary—Dr. D. E. S. Wishart

MEDICINE
Chairman—Dr. George S. Young
Secretary—Dr. G. H. Agnew

OBSTETRICS AND GYNÆCOLOGY
Chairman—Dr. H. B. VanWyck
Secretary—Dr. S. J. N. Magwood

PATHOLOGY AND BACTERIOLOGY
Chairman—Dr. Wm. Magner
Secretary—Dr. W. L. Robinson

PÆDIATRICS
Chairman—Dr. Alan Brown
Secretary—Dr. E. A. Morgan

PUBLIC HEALTH
Chairman—Dr. George D. Porter
Secretary—Dr. J. T. Phair

RADIOLOGY AND PHYSIOTHERAPY
Chairman—Dr. G. E. Richards
Secretary—Dr. A. H. Rolph

SURGERY
Chairman—Dr. Charles H. Gilmour
Secretary—Dr. T. A. J. Duff

REPRESENTING THE ACADEMY OF MEDICINE
Chairman—Dr. A. J. MacKenzie
Secretary—Dr. R. S. Pentecost

SUB-COMMITTEES

Reception, Convener—Dr. J. H. McConnell
Entertainment, Convener—Dr. F. C. Trebilcock.
Housing, Convener—Dr. M. H. V. Cameron.
Housing, Secretary—Dr. Gordon Foulds.
Dinners, Convener—Dr. D. E. Robertson.
Exhibits, Convener—Dr. R. I. Harris
Golf, Convener—Dr. Dennis Jordan.
Transportation, Convener—Dr. Roy Thomas.
Publicity, Convener—Dr. Roscoe Graham.
Badges, Convener—Dr. F. C. Harrison.
Information, Convener—Dr. J.-C. Maynard.

Any further particulars which may be desired regarding the meeting, will be furnished cheerfully by the General Secretary.

Reports of Societies

REPORT OF THE CANADIAN RED CROSS SOCIETY

An official statement issued in the latter part of February from the Headquarters of the Canadian Red Cross Society in Toronto shows that since the war this organization has spent on its peace-time programme of health conservation throughout the Dominion a sum of $7,000,000. Of this sum, which consisted of the monies available at the Armistice with the revenues accruing since that time, about one-half has been spent for the benefit of disabled ex-soldiers and their families. The other half has gone to support the peace-time services of the Red Cross, *i.e.*, for the improvement of health, the prevention of disease, and the mitigation of suffering. In the past year disbursements of the Society amounted to well over eight hundred thousand dollars in all parts of the Dominion, this sum including grants to Provincial Divisions as well as expenditures made for the national activities of the central body. Prepared by Dr. James W. Robertson, Chairman of the Central Council of the Red Cross in Canada, acting in conjunction with Dr. J. L. Biggar, Chief Commissioner, the statement deals in detail with the causes which made it imperative, at the close of the war, that Red Cross work should go on without pause; outlines the peace-time constitution of the League of Red Cross Societies and of the Canadian Red Cross as an integral part of the British and world Leagues; then enters into a résumé of the tasks which the Red Cross has undertaken or accomplished in Canada during the past six years.

These tasks are shown to have become urgently necessary because of the revelations made during the war. Never before had such immense numbers of men been subjected to medical examination and never had it been revealed that so large a proportion of them were in such shockingly poor physical condition. In Britain during the last year of the war only one in three was found to be fit for service. In Canada of the 361,605 draftees under the Military Service Act, 181,229, or almost one-half, were found to be physically unfit for full service in the field. The need for Health Reform through education was thus demonstrated to be as necessary as in Europe where the League of Red Cross Societies made the assertion "that a great part of the world-wide prevalence of disease and suffering is due to wide spread ignorance and lack of application of well established facts and methods capable either of largely restricting it or preventing it altogether.

Due largely to the education carried on since the war by the Red Cross and other health agencies in Canada, many thousands of our school children have been medically and dentally examined in the past few years. Through such examinations it has been clearly demonstrated that a very high percentage of Canadian children have defective teeth, that there is an almost constant ratio of one case of malnutrition in every three children and a far too high proportion of children with nasal obstructions or eye defects.

With this and much other evidence to back the now strongly held belief that many of the diseases of adult life arise in early childhood and that prevention must, therefore, begin during these years, the Red Cross began its health education programme with the children of Canada. Through its Junior Society which now numbers 137,000 children organized under the triple slogans of "Health," "Service" and "Good Citizenship," a highly constructive task has been undertaken with remarkably practical results. It has been shown that wherever the Juniors are strong in the schools, percentages of malnutrition fall and general health standards rise, a fact which is testified to by teachers, inspectors, medical supervisors, and educational officials in many Canadian provinces. Then too, the Juniors are health crusaders themselves, for, in the past five years, they have secured medical, surgical or hospital attention for 5,000 handicapped children in all parts of the Dominion; they support, in two western provinces, Children's Hospitals which have cared for 2,500 patients and they have undertaken to provide treatment for no less than 12,645 dental cases, a large proportion of whom are in Manitoba, where the Juniors specialize in this type of health work.

The Red Cross has entered another big field of health education through its Home Nursing Classes—now Dominion-wide—for wives, mothers and girls. Although these classes were not begun until comparatively recently, over 11,000 girls and women have taken this course of medical instruction in personal, home and family hygiene. Last year, there were 305 classes in all Canada, so that to date, it is estimated that this rapidly extending service has assisted materially in the improvement of the daily habits of not less than 45,000 people in the Provinces of British Columbia, Alberta, Saskatchewan, Ontario, New Brunswick, Nova Scotia and Prince Edward Island where these classes have been conducted. Soon after the war the Red Cross, finding nowhere in Canada provision made for an adequate course in public health nursing, arranged conferences with its Provincial Divisions, with university authorities, and health officials, with the result that to-day many Canadian universities now provide such courses. Through several Red Cross scholarships to the value of $350.00 each, further provision has been made for such nurses

as may be unable to finance this course and who wish to take it.

The Red Cross has financed for certain periods, in every province in Canada, the employment of Public Health Nurses, in the hope that the people served might be taught their value and would later bear the costs of this invaluable community service. This hope has already been realized in many places.

In the past six years the Red Cross has distributed 5,873,745 pieces of health literature, all prepared under the most expert advice.

In the past six years the Red Cross has established thirty-nine Outpost Hospitals and Nursing Stations in our hinterlands in Northern Ontario, Manitoba, Saskatchewan, Alberta and New Brunswick.

Another unique contribution of the Red Cross is the humanitarian service now supplied in the Seaport Nurseries in Saint John, Quebec and Halifax. Here the Red Cross co-operated with the Immigration and Health authorities to welcome, refresh and speed on their way the mothers and children among incoming immigrants. A friendly follow-up health card is filled in at the Nurseries for each family. Later these are forwarded to points of destination of the immigrants, where these strangers are again welcomed by the Red Cross or other agency and are extended all information regarding what to do or to whom to apply in case of accident, illness or distress.

At all times the Red Cross is pre-eminently the organization to which every one looks to carry out the desire to help in times of disaster. By special arrangements with the Department of National Defence, certain supplies are instantly released to the Society if need arises and immediate action is taken in the affected locality through the Divisional Headquarters of the Red Cross. In the past six years this organization in Canada has dealt with districts swept by forest fires, with villages destroyed by conflagrations, with countrysides ravaged by storms and with others where severe distress has arisen through drought.

Work of the Red Cross for ex-soldiers has consisted largely in supplementing and co-operating with governmental agencies in securing more adequate provision for all who suffered damage in the service of their country. Such work has been and is being quietly carried out all over Canada and will be for many years to come. The various Provincial Divisions of the Red Cross or Branches provide many comforts and services in addition to those from official quarters. Necessities for dependents of soldiers are supplied, regular visiting of soldier patients is done; in several provinces, Convalescent Homes have been established for ex-soldiers; in others sheltered occupations for partially disabled men have been initiated.

Health services such as have been and are being supplied are necessarily costly and health education is a slow process, but it is made abundantly clear that to leave such tasks as have been undertaken undone or unfinished, would be national extravagance. "The Red Cross can do more for the country in peace than it was able to accomplish during the war."

J. L. Biggar, M.B.
Chief Commissioner.

MEDICAL SOCIETY OF NOVA SCOTIA
HALIFAX BRANCH

A clinical meeting of the Branch was held at the Children's Hospital on February 2nd. Dr. Weatherbe presented a number of unusually interesting cases, the first being that of a girl aged 4 years, in whom a scoliosis had been noticed shortly after birth, and had become very marked, with pain. The x-ray plates had revealed a tumour, which was non-palpable and evidently internal to the chest wall. At operation the tumour was found to be about the size of a pullet's egg, firmly fused to the seventh and eighth ribs, and pressing upon lung and spine. The ribs were fused at the site of the neoplasm. It was removed with great difficulty, and found to be composed of bone and fibrous tissue, smooth and shiny on its inner aspect, and surrounded with a capsule. The cause and exact condition were left in doubt. The tumour could not have been detected without the x-ray, as there was no evidence of it externally. While the child appeared to die during the operation, it was revived by pituitrin and made a good convalescence. Treatment for the scoliosis was proceeding satisfactorily. A child of 9 years was then shown, exhibiting very marked enlargement of the tibiæ, femora and radii, due to congenital syphilis. Except for a three plus Wassermann there was no other evidence of syphilis. A third case was that of a girl aged 9, who has suffered from frequent fractures of different bones. The child presented marked evidences of rickets. Two cases of Pott's disease, well advanced in the correction of deformity, and two cases of club feet also well advanced in treatment, completed Dr. Weatherbe's demonstration.

Dr. Judson Graham exhibited a case of progressive muscular dystrophy, pseudo-hypertrophic type, and commented on the rarity of the condition and the characteristic manner in which the patient rises from a prone position. The case presented the more characteristic features of this disease.

Dr. T. B. Acker showed, first, a boy aged 11, who had come in with a surgical history extending over 8 years. There was nearly four inches of shortening of the right lower extremity, with 25 degrees elevation of the pelvis and much limitation of movement at the hip joint. The x-ray film showed marked damage to the acetabulum and disappearance of the head of the femur. Operative treatment, in two stages, had resulted in x-ray evidence of correction of the pelvic tilt, lessened abduction and callus forma-

tion at the point of arthrodesis. The patient is to remain recumbent, in plaster, for 4 months longer. Full weight bearing will not be allowed until x-ray and clinical findings show consolidation of trochanter and acetabulum. Dr. Acker's second case was a boy of 9 years with double hip joint dislocation of 6 years' standing. Manipulative treatment under anæsthesia had been successful in reducing both dislocations, and the x-ray films indicated a good result. Retention apparatus will be required for several months. In the third case, a girl of 8, a long standing dislocation of the left hip had proved rather refractory to manipulation. If another effort at reduction fails, an open operation will probably be undertaken. The fourth case was that of a boy of 8, with weak mentality, who had been unable to walk for 6 years. Muscles of the lower limbs were greatly atrophied, the knees were flexed at 150 degrees and both feet were in equinovarus. There were evidences of thyroid deficiency. Thyroid extract was prescribed, the deformities were corrected and plaster was applied. After 2 months, the plaster was removed and massage and muscle re-education were begun. There had been marked improvement in the mental condition, several of the muscles have developed strength, and the boy gets along well on crutches. Further improvement is anticipated.

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PITFALLS IN DIAGNOSIS

ADDRESS BY PROFESSOR FINNEY OF BALTIMORE

Diagnosis, said Dr. Finney, was sometimes spoken of as if it were a routine matter—as though any fool could make it. He himself, however, found great difficulty in reaching a positive conclusion, even with the best help he could obtain from the best instruments of precision. Some surgeons were accustomed to inveigh against the physician on this matter of gastric ulcer, saying satirically that the ulcer had been "cured" medically half a dozen times already. Well, perhaps it had, perhaps it had not. One surgeon in the States was accustomed to say, with a wave of his hand, "The aseptic scalpel is the absolute panacea for all surgical ills." That sounded well; it caught the gallery. But what about the percentage of mortality in every surgical operation? Even in the best hands, under the best conditions, in the best hospitals, there was an appreciable mortality rate in surgery, also an appreciable percentage of unsatisfactory results after operation. It puzzled him to hear surgeons claiming 100 per cent of cures for a given procedure.

In certain cases, even with the most skilled help, it was necessary to make an exploratory incision in order to ensure the diagnosis. With the open abdomen the surgeon was dealing no longer with a theory, but with a condition. In the absence of some definite, demonstrable pathology he found himself closing the abdomen again, and he thought that was good surgical judgment. It seemed to him that most of the bad results in surgery were due to the non-discovery of a definite pathological condition at the time of operation. Given the definite pathological diagnosis, the rest was easy. The actual art of surgery was a thing that almost anybody could acquire. It was a question of manipulative skill and of sufficient experience as a result of repeated operations. But surgical judgment was the rarer thing. It was not altogether intuitive—though some people seemed naturally to do the right thing—but most of it was just downright hard work, careful observation, and the exercise of one's reasoning capacity.

Dr. Finney was specially impressed with the difficulty of differentiating between a variety of possible things in dealing with abdominal conditions. Some years ago he was called out into the country to see a young girl who had pain in the stomach, vomiting, and so forth, and whose case, from the description, looked like a typical appendicitis. But after a close examination the only thing he was sure of was that this was not an acute appendix. The country doctor in charge of the case asked him what he was going to do, expecting him to do something. He replied that if he had the girl in hospital at Baltimore he would not operate. But he was compelled to return to Baltimore, and was begged to do something before he went. The case was put to the girl's parents, who were sensible folk, and they said, "Would it not be safer to take the appendix out?" Rather against his better judgment he took the appendix out, and found, as he expected, nothing there to account for the condition. Returning to Baltimore, he received next day a laconic telegram from the doctor; it read simply "Measles!" Every surgeon must have seen these abdominal cases, looking very much like appendicitis, in association with certain of the acute exanthemata, probably arising from some form of congestion. Shortly after this case he was called to see a child in Baltimore with a similar condition. With this experience fresh in his mind, and as the characteristic signs of an acute appendix were not present, he asked casually whether any measles were about, and learned that actually there was a case of measles in the same house. This case, again, proved to be measles; but, just to show how fatal it was to argue from one case to another, he was called shortly afterwards to another case presenting similar features, and on the strength of this experience he suggested measles; at two o'clock the following morning he was summoned by telephone to perform an operation for acute perforated appendix. The whole point of the matter was not to be too cocksure about diagnosis. It was better to have an open mind and the humble sense of being human and prone to mistakes.

Many years ago, before the x-rays were available, he was called to see a boy who was suffering from severe abdominal pain and upset. It

appeared that he had been eating nuts. Sir William Osler, who was in Baltimore at that time, used to say that every circus that came to town brought an epidemic of appendicitis owing to the consumption of peanuts and circus lemonade by the juvenile community. There appeared to be reason to suspect appendicitis in this case. But when Dr. Finney was sent for to operate he refused to accept the ready-made diagnosis. He satisfied himself that this boy had not acute appendicitis. One feature of the case was that the boy insisted on lying with his thigh curiously flexed, maintaining this position day after day. He thought of hip disease, of everything except the right thing. The boy had no local abdominal signs, though he insisted that his pain was abdominal. Sir William Osler was asked to examine him. By that time the boy had developed a cough, and as there was a history that he had visited a house in which there were several cases of typhoid fever, Osler, with this in his mind, said that it looked like an atypical typhoid, but beyond that he would not commit himself. Other diagnosticians were called in, but without result. Not until a week afterwards did the true condition reveal itself. It was an acute osteomyelitis in the ilium, and the pain had been referred to the abdomen. By that time the condition was septic, and although an operation was done, the boy died.

In diagnosis and in choice of operation also it was very important not to go upon preconceived ideas. Nothing militated so much against success. To determine the best thing to do, once the condition was diagnosed, was not a rigid matter at all; the whole of one's judgment had to be bent to the particular case in hand. There was no one surgical procedure which was applicable to all cases. The choice of procedure must depend upon the surgeon's judgment, experience, and observation of his own previous work and of the work of others. In gastric ulcer, for example, if the surgeon accepted the view, which was held by the Mayo Clinic, that 70 per cent of gastric ulcers developed cancer, he was not doing his duty to his patient unless he did a wide resection. If he held that the proportion of cases in which this eventuality occurred was smaller, then the question arose whether one was justified in sacrificing so large a proportion of a vital organ like the stomach to relieve what might be an innocent ulcer. That was a question which would be answered by one man in the affirmative and by another in the negative, but the important thing was for the surgeon to have a reason for the operative course he followed—gastro-enterostomy or any other—which he could successfully defend against anybody except the fanatic. One famous surgeon in the United States, Murphy, was fond of using two words, which, Dr. Finney thought, ought never to be used in surgery—the words "always" and "never." Surgery was not as easily predictable as all that. If a thing was said "always" to happen, there would be found to be occasions when it did not happen; if it was said "never" to happen, it would be found happening. He begged surgeons to work out a philosophy in all these matters, and above all things to remember that every unnecessary operation was a reproach to surgery.

Miscellaneous

GENTIAN VIOLET IN RHEUMATIC CARDITIS*

By William Gunn, M.B., Ch.B., Aberdeen

Late Senior House Physician, Victoria Park Hospital

The value of intravenous injections of gentian violet in the treatment of various blood infections has been studied extensively in America in recent years. It has been known for long to have a selective bactericidal action on staphylococci and streptococci, and for this reason Dr. G. Bourdon of the East London Hospital for Children who had previous experience with the drug tested its value in the treatment of rheumatic carditis. The action of gentian violet in attacking the vitality of certain tissues was known many years ago, but Cornil and Babes[1] first found it possessed a like injurious action on bacteria. Stilling of Strassburg[2] published a thesis on the subject, and found the dye a powerful bactericidal agent but failed to find any selective action. Its potential value in therapeutics was neglected until Churchman[4] began to experiment with it in 1910. The dye was first used on the living subject by Young and Hill[8] as an intravenous germicide on July 12, 1923. The patient had purple vision for 6 hours. The urine had a blue tinge for 24 hours, but no toxic effects otherwise were noted, and some improvement followed. The second case reported was a child of 15 months suffering from staphylococcal septicæmia with multiple abscesses. Three injections were given at intervals of 24 hours with the result that the leucocytosis diminished, the blood cultures were rendered negative, and the child made an excellent re-

* *Brit. M. J.*, Jan. 15, 1927.

covery. Brill and Myers[15] published 5 cases of staphylococcal septicæmia, all of which were uninfluenced by the drug and ended fatally. The latest publication is by Visher[16] who treated three cases of encephalitis lethargica and one of chorea with this dye. All 4 cases were becoming rapidly worse and the sudden change on injection impressed him so much that he strongly advised further trials of the drug. When the writer determined to use gentian violet for rheumatic fever, care was taken that the type of case chosen was such that any effect due to the drug would be fairly easily demonstrated. The cases chosen were characterized by smouldering fever, persistent tachycardia, nodule formation, loss of weight, progressive carditis, and lack of response to the usual specific treatment. In all the cases selected a fair trial had already been given to the usual therapeutic measures without leading to any definite improvement. It was found that as much as 12 mg. per kilo body weight as a single dose, and 5 mg. in repeated doses could with safety be given without producing any obvious toxic effect. Churchman and Russell[17] found that a dilution of 1 in 20,000 had no effect on growing tissues, while a 1 in 1,000,000 dilution inhibits the multiplication of staphylococci indefinitely, so that there is a considerable margin of safety in therapeutic doses. A brief summary of 10 cases of rheumatic carditis treated by intravenous injections of this drug are given. For the first few injections sterile normal solution was used to dissolve the dye, but as the salt seemed to interfere with the solubility sterile tap water was afterwards employed. The same dilution, 0.25 per cent, was used in their series. The available literature on the use of intravenous injections of gentian violet has been carefully reviewed. The failure of tonsillectomy to control the rheumatic infection was in the cases reported clearly shown. With moderately careful technique the method is safe and easy and leads to few if any ill effects. Of these 10 cases 8 were definitely improved, 1 was apparently uninfluenced, and 1 case did not receive a fair trial. From an examination of the results, it may be reasonably concluded that gentian violet opens a more hopeful future in the treatment of blood infections, and is worthy of a more extended trial. All the cases were in-patients of the East London Hospital for Sick Children or of the Victoria Park Hospital.

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THE SALE OF ULTRA-VIOLET GENERATORS TO THE PUBLIC

In the last number of the *Journal of the American Medical Association*, we note the report of the Council on Physical Therapy appointed by the Association to investigate and pronounce upon the value of the many mechanical and electrical devices for physical therapy offered to the public. In its report, the Council states that the sale of generators of ultra violet energy to the public for self treatment is undesirable and condemns such sale on the following grounds: the uninformed public is unable to take proper precautions in the use of such generators and may suffer severe injury. Unwarranted confidence in the therapeutic value of the generators, and their employment in improper and unsuitable conditions is liable to be stimulated by the literature of advertising agents. Moreover, such uncensored sale will encourage useless and fraudulent lamps to be placed on the market, as we are without any ready means of determining the value of each lamp. For these and other reasons the Council considers the sale directly to the public of such machines as detrimental to the public welfare.

CANADIAN JOURNALS

The February number of the *Nova Scotia Medical Bulletin* opens with some well written reminiscences of Yarmouth doctors of the "70's" by Dr. C. A. Webster of Yarmouth. There is a distinct historical value in reminiscences of this nature, for the medical man of the type they recall is passing fast, and records of them by contemporaries are needed. In consonance with this idea is the announcement in the same "Bulletin" of a gift to the Medical Faculty of Dalhousie University of a number of old surgical instruments by the late Dr. Augustus Robinson of Annapolis Royal. It is hoped that these will be a nucleus for the formation of a medical historical museum in the University.

We note also that the authorities in Dalhousie University have arranged to place the electrocardiograph of the Physiological Department at the disposal of those physicians desirous of using it. Cardiograms will be made by Professor

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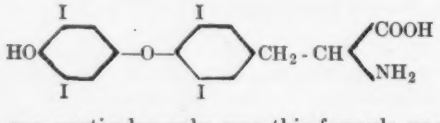
Dryer of the University. An arrangement of this nature would seem to be an eminently useful one.

The Canadian Journal of Medicine and Surgery refers in its editorial columns to the origin of the Guild of St. Luke, which began as in mediæval times as an association of painters. St. Luke according to tradition was a painter and to him is assigned a still existent portrait of the Madonna. But most authorities agree on his being a physician, and the present Guild of St. Luke was founded in 1864 in connection with medicine and nursing. Its object was the mutual encouragement and support of medical practitioners and students in leading a Christian life. The Guild appeals especially to medical students by whom and for whom it was founded.

The March number of the *Canada Lancet and Practitioner* calls attention to what is being done in Australia by the Government in helping to provide medical aid for those who are in remote and inaccessible districts. Apparently arrangements are being made for the institution of an aeroplane service which will transport medical men and dentists. Plans are being proposed for the installation of simple and inexpensive wireless services for the bush settlers. It is suggested that some such plans should be considered for out of the way Canadian districts.

The Chemical Society of Great Britain awarded the Edward Frank Harrison Prize for 1926 to Dr. C. R. Harrington of University College Hospital for his achievement in synthesizing in the laboratory the active principle of the thyroid gland. The following account appears in *Science*, vol. lxv, No. 1677.

Thyroxine was first demonstrated to be represented by the chemical structure:



In one particular only was this formula uncertain. The position of the four iodine atoms could not be definitely affirmed. It had been possible to remove these from the molecule of the natural product. It had been possible by two independent methods to synthesize in the laboratory the iodine-free substance by a series of reactions accurately defining its structure. It had not then been found possible to introduce into the synthetic substance those four atoms of iodine which, in their proper orientation, would create the molecule which is thyroxine.

In a joint communication by Dr. Harington and Professor G. Barger to the December meeting of the Biochemical Society, the final solution of the problem was unfolded. Commencing with hydroquinone and tri-iodo-nitro-benzene, a series of classical organic reactions were adapted with the issue of a product of the above chemical structure. The substance was chemically indistinguishable from that isolated from thyroid glands. The chemical chapter is complete, the biological story opens. Use was made of the now well established quantitative effect of the hormone on the basal metabolic rate. Two myxœdematous patients were chosen. Their basal rates were respectively 32 and 45 per cent below normal. Intravenous injection of the synthetic substance was spread over six days to a total dose of 14 mg., and the basal metabolic rates rose, in the first case to 6 per cent short of normal, and in the second to 3 per cent above normal. There occurred a coincident fall in body weight and increase in the pulse rate. Such activity was quantitatively as great as that given by natural thyroxine. Physiologically the two substances were indistinguishable. The structure of thyroxine requires the existence of two stereoisomeric forms, and we may suspect that the thyroid gland, by virtue of that elusive asymmetry of vital activities, synthesizes and employs but one of these isomers. That the substance obtained from the gland is the racemic mixture is due to the inevitable racemization which accompanies the process of separation, and it is not improbable that a resolution of thyroxine into its active forms will show that physiological activity is restricted to one only of these. This form should then be twice as active as the materials yet tested. The methods of physiology must now take the field. With thyroxine to hand there is available a means for the quantitative study of the rôle of the hormone and the function of the gland.

Action of Tetraiodophenolphthalein on heart.—The reactions observed in many patients following the administration of tetraiodophenolphthalein in the roentgen-ray study of the gall bladder have often roused considerable concern as to the condition of the heart. Accordingly, William D. Reid and Florence L. Kenway, Boston, have examined 13 cases electrocardiographically. Electrocardiograms were obtained before and at approximately 1 hour after the intravenous injection of tetraiodophenolphthalein and carefully examined for changes. In seven cases, the rate averaged 10 beats slower after the test, but in the remaining 6 it showed an average acceleration of 17 a minute. The conduction time, either auriculoventricular or intraventricular, did not show any alteration. Changes in the voltage of individual waves were slight and not consistently present.—*J. Am. M. Ass.*, Feb. 19, 1927.

Abstracts from Current Literature

MEDICINE

The Heart and the Aorta in Early Syphilis. Turner, Kenneth B. and White, Paul D., *Arch. Int. Med.*, January, 1927.

The authors state that it is well recognized that the organism of syphilis invades the blood stream early in the infection. It is also generally conceded that during this period of invasion the treponemes lodge in the various viscera, including the heart and the aorta. There is, however, a great diversity of opinion as to the time which elapses between infection and the first symptoms and signs of syphilitic heart and aortic disease.

In a review of the literature, the authors quote from various writers and show the great variation in conclusions. Grassman in 288 cases of secondary syphilis detected arhythmia or pulse disturbances in 85 per cent, and murmurs in 40 per cent; while Cohen says that syphilis rarely causes detectable damage to the heart in the primary and secondary stages. Marvin in 1920 also got absolutely negative results in an examination of 36 patients with a primary lesion of several weeks duration or early secondary manifestations.

In the present series, 50 cases of primary and early secondary syphilis were studied. This comprised a complete cardiac history, a thorough physical examination and Roentgen ray and electrocardiographic studies. No patients over 40 years of age were selected and no cases with other forms of heart disease such as rheumatism or arteriosclerosis were chosen. Cases of cardiac neuroses were also excluded. The only complications that existed were gonorrhœa and pregnancy and one case of mild diabetes.

In going into the past history of the group, 11 had had tonsillitis or frequent sore throats, 3 scarlet fever, and 2 diphtheria. Only 5 had experienced possible cardiac symptoms prior to infection, and these were mild in nature. Nineteen had passed life insurance or army examinations within a few years before the onset of syphilitic infection.

Eleven patients had a primary lesion on admission. Three had both primary and early secondary manifestations, while 36 were admitted during the secondary stage of the disease. The duration of treatment varied, at the time this study was made, from 6 days to 1 year. In none of the cases were any symptoms of cardiac disease obtainable, as beginning since the primary infection.

On physical examination, none of the cases showed arcus senilis. The eye grounds were normal. There were no abnormal pulsations, tracheal tug, friction rubs or evidence of congestive failure including cyanosis and œdema. In 39, the pulse was regular. Nine were regular except for sinus arrhythmia. Two cases showed infrequent extra-systoles. The pulse was not abnormal as regards rate, volume, and elasticity of vessel wall. The area of relative cardiac dullness was within normal limits in 49 of the cases. The sounds were of good quality and normal in most cases. A Roentgen ray examination was essentially negative in each case.

Their summary is as follows: a careful study of 50 cases of early syphilis, by history, physical examination, Roentgen ray examination and electrocardiogram showed no definite clinical evidence of disease of the heart or aorta in any case. A study of the literature shows that clinical evidence of cardiovascular disease in early syphilis is rare. L. C. MONTGOMERY

Glandular Fever in Children. Burnet, J., *Edinb. M. J.*, Feb., 1927, xxxiv, No. 2.

Glandular fever is now recognized to be an infectious disease, marked by feverishness, enlarged lymph nodes, with or without tenderness and general malaise. The cause, however, has not yet been discovered. Dr. Burnet reviews his experience of this disease during 25 years and concludes that there would probably be more cases reported, if it were not that many are too light to call for medical attention or for a definite diagnosis to be made.

There is some variation in symptoms, but the onset is usually rather acute. Albuminuria is often present. The spleen is palpable for several days even after the glandular swelling subsides. In three cases he noted a faint red, somewhat punctate rash.

The glands involved are almost always the posterior cervical but the other superficial nodes may also be enlarged. There is a leucocytosis in practically every case, generally of a moderate degree. The mononuclear leucocytes are so frequently fuond to be increased in number as to have induced some to regard this as an important feature and as a consequence they have applied to the disease the name of infectious mononuclosis. Others have suggested that it is a modified form of scarlet fever. The most likely channel of infection is the nasopharynx. The glandular enlargement whilst disappearing very slowly, never goes on to suppuration, and convalescence may be slow.

The writer has found sodium salicylate useful, and uses the liniment of belladonna for the relief of the pain in the glands. H. E. MACDERMOT

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SURGERY

Chills in Acute Appendicitis. Colp. R., *Ann. Surg.*, Feb., 1927, lxxxv, No. 2.

The literature referring to chills in appendicitis is reviewed and their diagnostic and prognostic value is discussed.

A series of 2,841 cases of acute appendicitis with a total mortality of 5.2 per cent is presented. The series is further analyzed with reference to the incidence of chills which occurred in 192 cases, the mortality in these cases being 6.8 per cent. There was a marked increase in the mortality rate (from 3.1 to 6.8 per cent) in the gangrenous cases with chills. On the other hand the chill does not seem to be such a serious prognostic factor when associated with general peritonitis, the mortality of these being only 8 per cent as against 20 per cent in the total series of such cases.

The importance of repeated chills as suggestive of pylephlebitis is emphasized, this is especially true in cases in which the appendix is found to be gangrenous. In such cases ligation or resection of the ileo-cæcal vein is advocated. A single chill in the early hours of onset seems to be of little diagnostic value. Post-operative chills are claimed to be invariably due to pylephlebitis. L. H. McKim

Tuberculosis of the Male Breast. Swan, R. H. Jocelyn and Fry, H. J. B., *Brit. J. Surg.*, Oct., 1926.

Tuberculosis of the male breast is a pathological curiosity, only 11 cases having been reported. Even in the female it is not very common. In this article is reported a case in the male, which clinically resembled carcinoma and was thus diagnosed. On examination at the laboratory, there was found an abscess cavity beneath the nipple. It was lined with a thick wall of yellowish caseous granulation tissue. This pus was evacuated which microscopically showed typical tubercle bacilli.

Tuberculosis of the breast was first described by Sir Astley Cooper in 1829, and the first case in a male by Heyfelder in 1851. The common period is the third and fourth decades. Heredity plays a minor rôle in etiology, but injury appears to predispose breast tuberculosis.

Breast tuberculosis may be classed as primary and secondary—the former with no other demonstrable focus. In the series of cases of tuberculosis of the male breast reported, the secondary type is commonest, and the routes of infection were by blood stream, lymphatics and direct extension. The following types are described: (1) acute miliary tuberculosis; (2) nodular; (3) sclerosing; and (4) mastitis obliterans. The nodular form is the predominant type in the male.

The symptoms are: a lump in the breast, rarely painful, situated near the nipple but it may be in the quadrants; skin adhesion and nipple retraction occur.

The differential diagnosis is:—

1. Ordinary pyogenic mastitis, distinguished by the chronicity, absence of pain and inflammation in tuberculous cases.
2. Granulomata, *i.e.*, actinomycosis and syphilis.
3. Simple and malignant tumours.
4. Fat necrosis, distinguished only by microscopic examination. The prognosis is good and surgical removal satisfactory. R. V. B. Shier

Traumatic Appendicitis. Behan, R. J., *Ann. Surg.*, Feb., 1927, lxxxv, No. 2.

Attention is called to the fact that certain post-inflammatory processes may so alter the walls or the mesentery of the appendix that they may become less than normally yielding, and consequently more susceptible to trauma. This trauma is usually some force which may suddenly increase the intra-lumenary pressure in the appendix. The mechanism by which injury may occur is discussed.

Traumatic appendicitis is more apt to occur in those patients who have a thin abdominal wall or a deficiency of muscular tone.

In medico-legal cases the necessity for good corroborative evidence is stressed. Pain must be present from the time of injury to the onset of the appendicular attack. This pain need not be in the part of the abdomen over which the trauma was received. Vomiting is frequent. There is usually an intermission between the primary reflex vomiting and the secondary vomiting due to inflammatory change.

A case of traumatic appendicitis from the author's practice is reported and several cases in the literature on the subject are reviewed. L. H. McKim

Acute Thyroiditis. Clute, Howard M. and Smith, Lawrence W., *Surg., Gyn. & Obst.*, Jan., 1927.

Acute thyroiditis is very rare. This fact is explained by other significant facts: (1) the thyroid is well encapsulated; (2) there is a very unusual lymphatic system, which allows of very free drainage; and, (3) certain authors ascribe a bactericidal function to the thyroid secretion. The physiology of the thyroid is still obscure, but, on anatomical grounds, it would seem likely that the secretion reaches the body as much by the lymphatic as by the blood stream.

Pathologically, acute thyroiditis resembles any other acute inflammation. Following the acute process one of two things occurs. Either the acute process localizes, or it subsides, leaving a certain residue. If the former, an abscess is the result, and the destruction depends on the type of infecting organism. If on the other hand the lesion subsides, we may find definite

areas of lymphocytic infiltration scattered throughout the stroma. Some authors credit these areas as being of etiological significance in the development of hyperplasia. With this view the authors do not agree, nor do they differentiate between thyroiditis and strumitis. It would appear that acute thyroiditis is almost invariably the result of a focus of infection elsewhere. The symptoms are usually acute in onset and marked by chills, fever and pain in the throat. Localized pain is very constant. Local heat and redness, and œdema are not common. Fluctuation in an abscess is not usual on account of the depth from the skin.

Simple acute thyroiditis usually lasts 6 to 10 days. Abscess formation is much more common in a goitrous gland.

Acute thyroiditis must be differentiated from hæmorrhage into a cyst, cellulitis in the neck and perichrondritis of the trachea or thyroid cartilage.

The treatment consists of ice-bag and sedatives. Abscess formation is to be carefully watched for during the course and, when present, early incision and drainage instituted. In opening the abscess the thyroid should be exposed as in a goitre operation. R. V. B. SHIER

PÆDIATRICS

Effect of Ultraviolet Light on the Blood of New-Born Infants, Preliminary Report: Bleeding Time, Coagulation Time, and Blood Platelets. Sanford, H. N., *Am. J. Dis. Child.*, January, 1927, xxxiii, 50.

This study is based on a series of 50 new-born infants. These infants were all of normal delivery, and the mothers had not been subjected to any anæsthetic that would interfere with the bleeding time and the coagulation time, which, with the blood platelet count, were taken immediately after birth, and at intervals of 24 hours thereafter. At the end of the fourth day, the ultraviolet treatments were begun on alternate infants; thus there were 25 normal newborn infants for a control, and 25 who had received irradiations. These treatments were not given until the fourth day, so that the bleeding and coagulation time would return to a lower value, which as Rodda has shown occurs by this time.

In the untreated infants there is no direct relation between the number of platelets formed and the age of the child. In the treated infants there is an immediate and direct increase amounting to 140,000 platelets in 4 days, or one-third of the total count. This apparently falls to normal after exposure is stopped. In infants receiving irradiation there is a decrease of one minute from the normal bleeding time. This decrease is also in direct relation to the increase in blood platelets. There was no change in the coagulation time. The author concludes that short exposures to the ultraviolet light would serve as a therapeutic measure in infants with delayed bleeding time, but their coagulation would have to be decreased by other measures. R. R. STRUTHERS

ANÆSTHESIA

Spinal Anæsthesia in Gynæcology, with a Report of Fifty Cases. Murphy, A. J., *Am. J. Obst. & Gyn.*, 1927, xiii, 214.

The writer uses nevocaine, a French preparation of novocaine. For vaginal operations the injection is made between the second and third lumbar vertebræ; for abdominal operations between the twelfth dorsal and first lumbar vertebræ. Immediately after the injection the patient is placed in the recumbent position with the head low to prevent anæmia of the bulb. If the Trendelenberg position has been used the head must be kept low during removal to bed, and for two hours afterwards.

The only contraindications are low blood pressure (100 mm. or lower), and a deformed spine. This method is specially indicated in operations upon patients with chronic myocarditis, chronic nephritis, hypertension, angina pectoris, pulmonary tuberculosis, emphysema, asthma, diabetes, or acute naso-pharyngeal infection. Complete muscular relaxation and decreased bleeding during operation are among the advantages of this method. Afterwards there is less distension, vomiting and pain.

Among the 15 abdominal operations done with spinal anæsthesia were 2 cases of umbilical hernia. Of 4 combined operations three were failures, owing chiefly to their long duration. W. B. HOWELL

Deaths Under Anæsthetics. Levy, A. Goodman, *Lancet*, January, 1927, p. 173.

A table from the Registrar-General's report on deaths from anæsthetics in England and Wales is given. They show a sudden increase in 1920 and another in 1923. These increases have been sustained. The writer thinks that little or nothing has been effected in the way of reducing the liability to death under anæsthetics.

At the present time chloroform in combination accounts for more deaths than any other form of anæsthesia. In 1911 the percentage of deaths from ether was 9 per cent. In 1923, when there were 123 deaths, it had risen to 32 per cent. Many of the deaths took place when the anæsthesia was for some trivial operation. Levy attributes the rise in the number of deaths under ether to the incomplete filling out of death certificates. In many of these cases the induction was effected with chloroform alone, or a mixture containing it, and the death should have been reported as due to chloroform. W. B. HOWELL

Obituaries

Dr. Robert N. Coulter, C.M.B., died in Aurora early in February. Dr. Coulter had practised for years in Aurora and later went to Ottawa to take the position of Deputy Postmaster General of Canada, which position he occupied for nearly 25 years. Although of late years better known in this official capacity, Dr. Coulter had been a much loved physician in the days of his extensive practice. An M.B. of Toronto in 1882, and an M.D. of Victoria in the same year, Dr. Coulter began practice in Richmond Hill moving later to Aurora where he practised for 30 years.

Dr. Alfred Farncomb (Trinity 1884) died in Newcastle on February 23rd.

Dr. Edward Holmes a native of Goderich, a graduate of Trinity College, Toronto, died at Cleveland February 23rd.

Dr. A. A. Weagant died on March 3rd,, in his home, after a prolonged illness. He was born August 15, 1865 at Williamsburg, Dundas County, Ont., the son of Mr. and Mrs. C. W. Weagant. The doctor attended the high schools of Morrisburg and Almonte, Ontario, and later graduated in medicine from McGill University in 1888.

After a few years practise at Dickson's Landing he went to Ottawa, where he carried on the practice of medicine for a number of years and was connected with the staff of the Protestant Hospital of that city. He was also for about five years a member of the Ontario Provincial Board of Health, relinquishing his duties in that connection in 1917, when he moved to Winnipeg to take up practice with his brother, Dr. C. H. Weagant, and his uncle Dr. Allen Weagant. The doctor was prominent in fraternal societies being at one time a member of the Masonic lodge, and later the A.O.U.W., Foresters and Orange lodges. Dr. Weagant was an Anglican and was a memberof the Diocese of Ottawa, later becoming lay secretary.

Besides his widow, he is survived by a son, Reginald, and daughter Gladys both of Winnipeg; two brothers Dr. C. H. Weagant of Winnipeg, and Rev. G. E. Weagant of Oaklands, Cal., and one sister Mrs. Andrew McCaw of Bedford, Que.

In **Dr. Thos. H. Wilson** who passed away at his residence on February 14th after a very brief illness, Vancouver has lost one of her pioneer medical men. Dr. Wilson graduated from Manitoba Medical College in 1897 and came to Vancouver the following year. Settling in an office on Main Street he gradually built up an extensive practice. Although of a quiet and almost retiring disposition, he made many friends and only those who knew him best realized the kindliness of heart which lay beneath the quiet exterior.

Never taking an active part in medical organizations, he yet maintained his interest in all matters touching the profession, and was a consistent upholder of the ideals of that profession. As a member of the community, he stood for the best influences and good citizenship.

He leaves a wife and two children, his son is attending the University of British Columbia, while his daughter is at present at Whitley College.

Dr. James A. Wilson died in Guelph February 22nd. Dr. Wilson had graduated at Trinity in 1893 and had practised in Mildmay for 27 years before coming to Guelph, where he had spent the last 7 years of his life.

News Items

AUSTRALIA

QUEENSLAND

The Commissioner of Public Health of Queensland, Dr. J. I. Moore, has issued his report for the year ending June 30, 1925. The report contains much interesting information. While a certain amount of good has been accomplished, the interest of the report frequently lies in a revelation of what has not been even attempted.

Statistical

Queensland prides itself on its position in the world of statistics. It occupies the third position among the countries of the British Empire in the lowness of its infantile mortality rate and the second in the lowness of its death rate. A fall has taken place in the crude birth rate. While the rate in 1915 was 29.25 per cent, it had decreased to 24.89 per cent in 1923 and to 23.88 per cent in 1924. During the last ten years the death rate has fallen by 2.12 per cent and during the same period the infantile mortality rate has fallen by 13.03 per cent. The death rate for Queensland in 1924 was 8.88 per cent. It was second to New Zealand which had a death rate of 7.96 per cent. The infantile mortality rate for 1924 was 51.3 per thousand births. In Western Australia this figure was 49.9 and in New Zealand it was 40.2.

The estimated population for the State for the year 1924 was 834,894; for 1923 it was 811,168 persons.

Pulmonary Tuberculosis

A fall has taken place in the number of cases of pulmonary tuberculosis notified during the year. The number for 1924-1925 was 348 and for the previous year 414. A staff nurse is employed by the Department and it is her duty to visit the homes of infected persons for the purpose of advising in regard to measures for the prevention of the disease.

Anterior Poliomyelitis

A considerable increase occurred during the period under review in the number of cases of anterior poliomyelitis. During the previous period the number of infections was 8, during this period the number was 142. Eighty-eight patients were males and 54 were female. The patients were isolated in hospitals or in their own homes, disinfection was carried out and children contacts were kept from attending school for 3 weeks.

As a step towards the education of the public in matters of health we learn that a movement is on foot for the Australasian Medical Publishing Company to issue a journal for health comparable to *Hygeia*

in the United States. This has been contemplated for some time and the details of publication have been worked out, although no numbers of the journal have yet appeared. It is also planned to make it the channel for publication of information supplied by the Commonwealth Department of Health and the several State Departments.

It is insisted that this is not to be a "popular" journal but rather a health journal which it is hoped will become popular.

GENERAL

Wellesley Hospital Clinical Society met on March 10th, the following programme was presented: (1) "Rupture of the thyro-hyoid membrane," Dr. J. F. Elliott; (2) "Hepatitis," Dr. H. A. Bruce; (3) "Report of a case of acute pyelitis," Dr. F. W. Marlow; (4) "Four cases of osteitis fibrosa of jaw," Dr. Fulton Risdon.

The Harvey Club of London met on February 23rd, at the Highland Golf Club. The meeting took the form of an annual banquet and social evening.

The section of Medicine of the Academy met at Toronto General Hospital on March 8th. The programme consisted of a presentation of medical cases by the staff. The section of Surgery took also the form of a clinical meeting at the Toronto General Hospital. The Pædiatric section staged a clinical meeting at the Sick Children's Hospital on March 17th.

A programme of exceptional interest was presented on March 22nd at the meeting of the section of Pathology.

The stated meeting of the Academy of Medicine of March 1st, took the form of a Symposium on Physical Therapy.

NOVA SCOTIA

The board of the Memorial Hospital at Middleton propose to make a substantial enlargement of the hospital.

Preparations are being made for appropriate celebration in June of the silver jubilee of St. Joseph's Hospital, Glace Bay.

On the occasion of the February meeting of the Osler Medical History Club, Dr. Hattie, the host of the evening, read a paper on Richard Mead.

It is proposed to build an annex to the Sydney City Hospital, for the accommodation of persons suffering from advanced tuberculosis.

Dr. A. C. Jost, Halifax, has for the second consecutive year won the first prize for essays written for the Maritime Library Association. Dr. Jost wrote on "The Battalions of the 68th Regiment, disbanded in 1783."

The new Kings County asylum for the harmless insane is nearly ready for occupancy. Mr. and Mrs. Howard C. Smith have been appointed superintendent and matron respectively. Both are graduates of the Nova Scotia Hospital training school, and have held administrative positions elsewhere.

Dr. Clarence F. Moriarty, a graduate of Dalhousie, has been appointed to the staff of the International Health Board and assigned to duty in the Philippines. Dr. W. J. MacDonald, another Dalhousian, has been made Commissioner of the Brooke County Health Department, with headquarters at Wellsburg, West Virginia.

Dr. C. M. Hincks, of Toronto, and Dr. George L. Wallace, of Wrentham, Mass., were recent visitors to Nova Scotia and addressed public meetings at Halifax and elsewhere, arranged by the Nova Scotia Society for Mental Hygiene. Dr. Wallace, who is superintendent of the Massachusetts State Training School for the Feeble-Minded, is a native of Nova Scotia.

The vital statistics of Nova Scotia for October last were published recently by the Provincial Department of Health. During the month there were 939 births and 453 deaths. Measles, scarlet fever and influenza were unusually prevalent, but the mortality from all forms of communicable diseases was the same in the corresponding month of the previous year. The infant mortality rate was 88.2, as compared with 53.1 in October, 1925.

The annual meeting of the Halifax Visiting Dispensary was held on February 14th. The reports presented show that this institution continues to render splendid service to necessitous sick people. Consideration was given to possible means of extending its work. The Dispensary is one of the oldest medical institutions of Halifax, and has always had the fullest endorsation of the medical profession.

Six young ladies were awarded the diploma of the Grace Maternity Hospital, Halifax, on February 15th. The graduating exercises were largely attended. Among the speakers were Commissioner Maxwell, of the Salvation Army, who emphasized the dignity of service, quoting from Ruskin: "Life without industry is sin, and industry without heart is brutality." He extolled the work of the nurse, which has upon it the mark of divinity as well as of humanity. The Florence Nightingale pledge was administered by Dr. H. B. Atlee, after appropriate reference to the work of the Salvation Army and of Florence Nightingale. Dr. P. A. MacDonald addressed the graduates, pointing out that their chosen profession requires the most unselfish exhibition of devotion and service.

The Royal Commission appointed to investigate feeble-mindedness in Nova Scotia, on which the medical profession was represented by Dr. G. E. Murphy, has presented its report to the provincial legislature. In its investigation, the Commission had the assistance of the Canadian National Committee for Mental

Hygiene, which placed two surveying parties in the province under the direction of Drs. C. M. Hincks and W. T. B. Mitchell. The Commission recommend, *inter alia*, the appointment of a provincial psychiatrist, the establishment of psychiatric clinics and the erection of a provincial training school for mentally deficient children. It is generally believed that legislation which has been introduced by the Government to give effect to the recommendations will be adopted by the legislature.

Dr. W. J. Egan, of Sydney, who was appointed a commissioner to inquire into certain alleged abuses in the operation of the Workmen's Compensation Act, has presented his report to the provincial government. While the complaints investigated were unlike those infrequently urged by medical men, Dr. Egan's report is of interest to the profession. In general, his findings are to the effect that there is little ground for most of the allegations. He takes occasion, however, to state that the chairman of the Workmen's Compensation Board sometimes ventures to personally make medical examinations and in such cases, claims are adjusted on the basis of the chairman's "medical" report, and compensation is not always just or adequate. The chairman of the Compensation Board, in a letter to the press, asserts that Dr. Egan is mistaken in these particulars.

In Nova Scotia the inspection of the humane and the penal institutions is a function of the Department of the Public Health, and to every session of the legislature the Provincial Health Officer makes separate reports on health, and on each of these types of institutions. The reports which Dr. Jost has presented of the experience of the year ended September 30th last are, as in the past, of much interest to the profession. In that which deals with the penal institutions, he presents tables showing ages of those admitted to the several gaols and the numbers of repeaters. This marks the beginning of a study of age in relation to recidivism. He points out that "it is as irrational to attempt the moral regeneration of a criminal without an accurate record concerning his antecedents as it would be to attempt to ameliorate his physical ailments without knowledge of the incidents leading up to the condition for which he seeks relief." He again calls attention to the inadequacy of the present system, which has little tendency to prevent recidivism, and recommends consideration of a more rational method of dealing with offenders against the law. In his report upon humane institutions, which provided care for 17,465 persons during the year, Dr. Jost comments favourably upon the general and special hospitals, but states that several of the local asylums are still far from creditable. Admissions to the hospitals show a considerable increase as compared with the previous year, but the reverse applies to the local asylums. The report on health and vital statistics shows gratifying improvement over all previous years in the infant mortality rate, which was 67.5. There was a small increase, compared with 1925, in the number of births. The general death rate, however, went up a little, while the tuberculosis rate remained practically as for 1925. The pneumonia death rate was unusually high, and there was a sharp rise in influenza deaths. Diphtheria, scarlet fever and typhoid fever combined accounted for only 41 deaths. Reference is made to the successful inauguration of special antituberculosis work, to re-organization of the public health laboratory, to better reporting of infectious conditions, to increased attendance at the various health clinics, and to more extensive educational work. An extended laboratory study of the relative merits of the Wassermann and Kahn tests is in progress.

NEW BRUNSWICK

The annual meeting of the Chipman Memorial Hospital at St. Stephen, N.B., on March 11th, was the occasion for a statement from the Board of Directors to the effect that the hospital year had been a most successful one; also that the hospital had attained a new record for the number of cases treated and for the number of hospital days. It is expected that improvements in building and equipment will be provided for during the next year.

The number of scarlet fever patients in Saint John shows but little sign of diminishing, so much so that the Epidemic Hospital there has been forced to refuse further admissions because beds are not available. The number of cases reported to the Board of Health for the last few months has been as follows: November, 87; December, 60; January, 77; February, 67; and March to date, 35.

The mental hygiene council of New Brunswick was organized at an inaugural meeting in Saint John this month, and steps were taken to present various aspects of this important problem to the provincial government at its present session. Special efforts will be made to provide for proper institutional care of the feeble minded. A great share of the credit for this work is to be given to Dr. Mabel Hannington of Saint John.

Dr. S. H. McDonald and Dr. H. A. Farris appeared as a committee before the New Brunswick legislature with a request that the provincial government assume a greater financial responsibility for indigent patients suffering from tuberculosis. Their request was considered sympathetically and a promise of an increase in their yearly grant towards the County Hospital was given by the government. It seems reasonable that tuberculosis should be treated as a provincial matter and such cost of patients' hospitalization should be borne by the provincial treasury. It is to be hoped that further monetary support will be given to our tuberculosis institutions.

On February 8, Dr. A. Stanley Kirkland appeared before the Medical Society of Fredericton and read a paper on Peptic Ulcer. The subject was discussed under various headings as follows: Pathology, Dr. Arthur F. VanWart; Diagnosis, Dr. Charles McKay; Medical treatment, Dr. D. W. Ross; Surgical treatment, Dr. G. Clowes VanWart. There was a full attendance of members present and the Fredericton Medical Society is to be congratulated for its enthusiasm in carrying out a winter programme of meetings.

Dr. H. A. Farris, Superintendent of Saint John County Hospital for Tuberculosis sailed for Europe on March 25th, where he will attend clinics in London and Vienna. His colleagues wish Dr. Farris a most pleasant and profitable trip. Previous to his departure, he was a guest of honour at a complimentary dinner tendered to him by the Commissioners of his hospital. He was made the recipient of a pair of binoculars, accompanied by a laudatory address. Dr. Farris has spent a busy month, having appeared before the Medical Society at Moncton late in February and

was the chief speaker at a public meeting at Sussex early in March.

Dr. G. A. B. Addy of Saint John is spending sometime in the southern states, preliminary to a short course of clinical study in New York City.

In the local press it was noted the other day that a considerable extension to the Moncton City Hospital is proposed. This will be gratifying news to many as the Moncton Hospital has been doing splendid work in rather cramped quarters. As soon as affairs are in definite shape, complete information of the proposed structure will be made available.

While in Fredericton lately, the writer was informed that the Fredericton Hospital was the first in the Maritime Provinces to purchase an x-ray machine. The original instrument is now on exhibit in the Museum at the University of New Brunswick. At the same time he learned that to the late Dr. Atherton, of Fredericton, is due the credit of being the first surgeon of North America to successfully close a perforated duodenal ulcer. This point is, perhaps, a contentious one as others claim to have performed the same feat at or before the time of Dr. Atherton's first case.

Medical history such as the above, is perhaps, too little known and adds something to one's interest in our profession.

Dr. J. R. Nugent of Saint John is forwarding arrangements for the combined meeting of representatives from Nova Scotia, Prince Edward Island and New Brunswick to be held at Moncton on March 24th. This meeting will consider matters of general Maritime medical interest and also arrange the place of meeting of the Canadian Medical Association in the Maritimes in 1928.

Dr. Mayes Case, Saint John, is spending a month attending clinics in Toronto, Montreal and New York.

A. STANLEY KIRKLAND

QUEBEC

Every person employed in a restaurant or public eating place will have to undergo a medical examination and obtain a certificate of health every six months, according to the new restaurant by-law, which has been drafted by the City Administration and will be put before Council at its next meeting. There are a dozen chapters in the new regulations, which contain 92 articles. The City Health Department will be called upon to disinfect all eating houses regularly, and can prescribe a general cleaning if this should be found requisite. All restaurants and eating places must be erected in salubrious localities, and no cellars or other underground places may be used as a dining room; all dining rooms, kitchens, etc., must be well aired, lighted and properly heated. Walls, ceilings, floors, furniture, etc., must be kept clean at all times. No food may be served which has not been inspected, or which is in any way spoiled or decomposed. The health department is responsible for the observance of this by-law, which ranks with the pure milk and meat by-laws in the series of health ordinances being compiled by the city administration.

A new and improved method of pasteurization of milk, which alters the milk very little, preserving the vitamines, the cream and the taste; a new vaccine discovered at the Pasteur Institute against anthrax, typhoid, and dysentery; and a new vaccine against diphtheria and tetanus also discovered at the institute, will be demonstrated in Montreal within a short time by Dr. L. Boez, famous French bacteriologist who has arrived at the University of Montreal to lecture and demonstrate for 10 weeks in connection with the recently established Institut Scientifique Franco-Canadienne. Former assistant to Prof. Calmette, the famous authority on tuberculosis and assistant director of the Pasteur Institute, Paris, Dr. Boez is particularly interested in tuberculosis. Before the war he worked with Calmette at the Pasteur Institute on vaccination for tuberculosis. Atfer the war Dr. Boez was called to the University of Strasbourg as Professor of Bacteriology and was also appointed Assistant Director of the Hygiene Institute of Strasbourg. Last year he served for one year on the American Commission for Foot and Mouth Disease.

An urgent need for more beds to care for tuberculosis patients, was the keynote of all reports and addresses delivered at the 17th annual meeting of the Royal Edward Institute. Dr. R. E. Wodehouse, secretary of the Canadian Tuberculosis Association, stated that Montreal required 500 additional beds to care for those suffering from this disease. He drew attention to the fact that at present the city has about 6.6 beds per death from the disease, for a population of 670,000 people, suffering a tuberculosis death rate of 139.7 per 100,000 population, but this proportion of beds is not based on the dependent population surrounding Greater Montreal, he explained.

The Laurentian Sanatorium Association, which held its annual general meeting recently, reports that it is faced with a deficit of $39,242 at the close of its first 16 months of operation. The report states that the sanatorium "finds itself in exactly the same position as all hospitals in the province, namely, that it is quite unable to make both ends meet on the present daily allowance from the provincial government. But, whereas most of the other hospitals in the province are endowed or have substantial subscription lists, this is a new association and has no other source of revenue at present, than that derived from a limited number of paying patients and the government allowance for indigents. Operating cost per patient per day has amounted to $2.06 and from a comparative statement which has been prepared, it is shown that this cost is the lowest in Canada so far reported for the year 1926. The average revenue per day from all patients has been $1.64 while the expenditure has been $2.07, showing an average daily loss per patient of 43 cents, but the revenue received for such indigent patients is only $1.34, so that the loss incurred in the treatment of these patients alone is 75 cents per day."

In view of the fact that the Verdun Protestant Hospital has an ever increasing list of incurable cases, there was an urgent need for more equipment and a new building. This was brought out by Dr. C. A. Porteous, medical superintendent, at the 49th annual meeting of the hospital board. His report showed that the population of the hospital at the end of the year was 846, and the number of patients admitted during the year totalled 258, one-quarter of that

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number being considered incurable cases. Dr. Porteous also deprecated the over-crowding in the present building, and was of the opinion that even with the new hospital at Bordeaux Jail the demands on the hospital would not be less. "In my opinion," he declared, " a new building is the only solution if we wish to be modern and not antiquated in our housing of the mentally sick." The treasurer's report showed a deficit for the year of $6,036. The revenue was $288,525. It was the decision of the meeting that the public be made fully aware of the state of the hospital, and that an urgent canvass be made for new governors. At present there were only 200 governors, which number the present Board wish to increase by as many more, and therefore an appeal will be made to the public to become associated with the work of the institution by subscribing as life governors.

During the past year 2,088 patients were cared for in the St. Justine Hospital, which during the past 12 months witnessed a great expansion, and with the aid of the $72,675.00 raised during the public campaign and the government grant of $150,000, the work of completing the new portion of the hospital is being continued. At the present time the institution has 200 beds. Last year the capacity was 160. The new portion of the building will have accommodation for crippled children, and it is expected that a school will be started as soon as it is completed so that the little patients will have educational means at their disposal. The report of the treasurer showed that the income for the year was $88,639.00; general expenses $99,-319.00, leaving a deficit of $10,680.

An industrial clinic is to be inaugurated this spring at the Montreal General Hospital, under the Department of Public Health and Preventive Medicine. It is expected that at its head there will be a graduate of McGill, who has been working on the subject for the last 5 years. Dr. Chas. F. Martin, Dean of the Medical Faculty, said that the inauguration of the clinic marked one of the greatest advances in recent years in connection with the medical faculty, since it would link up the great industrial corporations and McGill University.

Dr. Otto Klineberg, a graduate of McGill University, now at Columbus University, where he is lecturer in psychology and is proceeding towards the Degree of Doctor of Philosophy, has been granted by the United States Government, a National Research Fellowship of the value of $1,800. with traveling expenses. He will continue his studies in England, France and Italy, leaving next fall, after taking his Ph.D. degree. Dr. Klineberg graduated in Arts at McGill in 1919, winning the Prince of Wales Gold Medal in philosophy and a Scholarship at Harvard, from which university he graduated in 1920. He returned to McGill and entered the Faculty of Medicine, graduating in 1925. While at McGill he took a prominent part in student activities and held several offices.

ONTARIO

On February 14th, at a meeting of the Kingston and Frontenac Medical Society, Dr. H. K. Detweiler gave an address on "Asthma and hay fever."

The Welland County Medical Society met at Welland on February 15th, when Dr. H. A. Dixon gave a talk on "Common skin affections, their diagnosis and treatment," with lantern slide illustrations.

On Thursday, February 17th, the Lincoln County Medical Society met at St. Catharines. Dr. John Oille gave a talk on "Chest pain."

At a meeting of the Brant County Medical Society held at Brantford on February 24th, Dr. R. G. Armour of Toronto gave an address on "The diagnosis and treatment of syphilis of the central nervous system."

Dr. J. K. MacGregor of Hamilton addressed the North Waterloo Medical Society at Kitchener on February 25th, his subject being "Contra-indications to surgery."

At a meeting of the Welland County Medical Society held at the Welland Club, Welland, the following officers were elected for the current year: President, Dr. John Shultis, Port Colborne; Secretary-Treasurer, Dr. G. N. Black, Humberstone.

MANITOBA

On March 4th Drs. Wm. Boyd, T. G. Hamilton and Prof. J. C. B. Grant addressed the members of the Brandon and District Medical Society. The afternoon meeting was held in the Brandon General Hospital, Dr. Boyd taking as his subject "Endocarditis" and Dr. T. G. Hamilton "Infections of the hand," and "Psychic research." A dinner was held at the Prince Edward Hotel and following this Prof. Grant gave an address on "The evolution of man."

Dr. Gordon S. Fahrni of Winnipeg was elected president of the American Society for the Study of Goitre at the recent annual meeting in Philadelphia. The next meeting of the society will be held in Denver.

The handsome club rooms of the Winnipeg Medical Club in the Medical Arts Building were formally opened on February 24th. Not only doctors and dentists but also their wives took part in the amusing programme and enjoyed the dance which followed.

Dr. C. A. Pincock, medical missionary of the United Church at Sezchwan, China, returned to Winnipeg a few weeks ago with his wife and family and is visiting his father, Rev. James Pincock.

Under the direction of Dr. A. T. Mathers, provincial psychiatrist, a survey is being undertaken of school children in Manitoba three years or more below standard in school grades or who present other signs of mental deficiency. In the city of Winnipeg the work is being carried on in conjunction with the school physicians and

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the outdoor clinic of the Psychopathic Hospital, in the south-western part of the province, Drs. Barager and G. A. Davidson are making the survey, while in the other parts of Manitoba Dr. W. M. Musgrove is conducting the investigation. It is hoped to complete the work in the larger centres by the end of April. The survey will not only enlighten the government as to what provision should be made for the care of backward children but should also prove of great assistance to school authorities and teachers.

Dr. D. F. McRae of the Manitoba Sanatorium was recently in Winnipeg. His many friends will be pleased to hear that his health is much improved.

SASKATCHEWAN

SASKATOON SANATORIUM

The Saskatoon Sanatorium was built by the provincial government and opened in April, 1925. It is the second institution in the province operated by the Saskatchewan Anti-Tuberculosis League, of which Mr. A. B. Cook is President and Dr. R. G. Ferguson, Director of Medical Services. The original accommodation was 125 but this has been increased to 150 by the opening of the nurses home in November, 1926. As many as 160 patients have been accommodated.

As at the Fort Qu'Appelle Sanatorium, facilities and staff are provided for the examination of patients referred by practising physicians. Whether it be for diagnosis or for treatment only those patients may come to the Sanatorium who bring an introduction from a physician. In this way the Sanatorium must be considered as the general practitioner's assistant.

In the year 1925, 415 patients and in 1926, 464 patients came to the Sanatorium either for diagnosis or for treatment. Recently the League has discussed with the government the question of increasing the accommodation which has always been taxed.

Besides the diagnostic facilities mentioned above, the Sanatorium supplies a physician in the summer months who calls on physicians (except in the larger centres) to give assistance in the diagnosis of tuberculosis and other pulmonary diseases. The League has been doing this work for years in the southern half of the province but in the past summer the northwestern quarter of the province was covered by Dr. John Orr (recently of Winnipeg). In the summer of 1927 it is the intention to visit the physicians in the northeastern part of the province. The physician doing this work not only assists the local doctor in diagnosis but also gives advice concerning the home treatment of tuberculous patients and he, also, by his visits, is able to keep in closer touch with ex-patients of the Sanatoria.

On February 14th, the Council of the College of Physicians and Surgeons of Saskatchewan, together with the Executive of the Saskatchewan Medical Association, met at Regina to consider the bills introduced into the Legislature re chiropractors and osteopaths. While at Regina, they, together with the medical members of the House, were the guests of the Regina District Medical Society at dinner in the Parliamentry Restaurant. After dinner the bills were thoroughly discussed and a committee was chosen to meet the committee of laws and amendments on Tuesday morning.

The Regina District Medical Society held its regular monthly meeting at the Hotel Champlain; dinner being served at 6.15. Dr. W. A. Thomson gave a paper on "Cough" and Dr. Laurent Roy a paper on "Extra uterine pregnancy."

Dr. F. Amyot, son of J. Amyot, of the Federal Department of Health has been working in the neighbourhood of Isle La Crosse, for the Saskatchewan Department of Health. It is expected that a hospital will be erected there in the near future for those living in that outlying district.

Dr. G. F. Fairbairn, formerly of Springside, is now at the Belmont Sanatorium, San Mateo County, California.

Dr. J. B. Tucker, of Hazenmore, is at present visiting Eastern Canada, having been called there owing to the illness of his father.

At the present time, there are three or four locations vacant, and any doctor wishing a change should communicate with the Registrar of the College of Physicians and Surgeons, at Saskatoon.

ALBERTA

At the annual meeting of the Council of the College of Physicians and Surgeons of Alberta held in Calgary on February 25th, after much discussion the Council passed the following resolution which has been sent to all the members of the profession in the province:

"Resolved that the practice of a physician requiring his patient to go to a single specified pharmacist to have his prescriptions filled, when and where others are available, is an infringement upon the rights of the patient and prejudicial to the interests of pharmacists generally and is therefore considered un ethical;

Further that the prescribing of mixtures, drugs, and medical preparations by secret symbols, ciphers or terms intelligible only to the prescriber and a specially informed pharmacist, is unnecessary, unethical and capable of gross abuse;

We believe such action contrary to the ethics of the medical profession, and go on record in strongly condemning such conduct and method of prescribing."

The following officers were elected at the annual meeting of the Council of the College of Physicians and Surgeons for 1927 and 1928: President, Dr. W. V. Lamb, Camrose; Vice-President, Dr. W. A. Wilson, Edmonton; Registrar-Treasurer, Dr. George R. Johnson, Calgary. Dr. W. A. Wilson was appointed representative from the Council on the Senate of the University of Alberta. Dr. R. Parsons and Dr. H. W. McGill were appointed to the Executive Committee of the Alberta Medical Association.

The Council issued a protest against the granting

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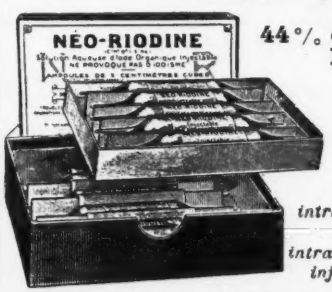

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of a Dominion charter to a company which was apparently attempting to commercialize the high esteem that the public in general have for the medical profession, by incorporating a business concern under a medical name.

A case which has aroused much interest in the province occurred lately in a country district where a child of 4 years of age died during the administration of chloroform for a minor operation. The physician who gave the anæsthetic and at the same time attempted to operate was brought into court on a charge of manslaughter. Expert testimony was given by Dr. J. L. Allen of Calgary, who adduced that it was impossible to always tell whether a patient is fit for an anæsthetic or not. Death may ensue from other causes than the anæsthetic and such accidents occasionally happen. While chloroform is a recognized anæsthetic and has been widely used, its place has been taken in large measure by ether. In this instance the physician had used absorbent cotton wool over the child's face upon which he dropped the chloroform, a method he has used for 34 years. The use of cotton wool Dr. Allen did not consider a wise procedure if gauze or some such material were at hand. The physician was acquitted.

According to the 1926 report of Dr. Geraldine Oakley, physician to the Calgary public schools, 21 per cent of the pupils were found to be 10 per cent or more underweight. Of the total of 9668 examinations made and defects discovered, 4617 were not vaccinated. Dr. Oakley emphasized the important point played by over-fatigue in the production of malnutrition. There are too many children who do not get sufficient rest during the day and an adequate amount of sleep during the night. Outside attractions absorb too much of their time and energy and prove too alluring. Among the children examined 87 were found to have pulmonary lesions. The great majority of these were either asthma or chronic bronchitis. Only 2 cases of active pulmonary tuberculosis were discovered, whilst a number were classed as "suspected pulmonary tuberculosis," and were requested to report frequently for further examinations. Toxoid inoculations for the prevention of diphtheria totalled 2604. The report states that "our system of referring physical defects to the family physicians is now on a working basis." There were 2262 cases referred to family physicians and 984 received treatment.

Dr. R. R. Paul, formerly of Youngstown, has taken over the practice of Dr. T. R. Whaley at Alsask.

Dr. M. J. Brayton, after spending the past year in post-graduate work in the East, has settled in High River.

We are pleased to note that Dr. J. G. Carson of Vulcan is well on the road to recovery after an operation at the Calgary General Hospital. His practice is being looked after by Dr. E. W. De Long of Calgary.

G. E. LEARMONTH

BRITISH COLUMBIA

The programme for the seventh annual Summer School of the Vancouver Medical Association is now almost complete and will be distributed it is hoped early next month. The speakers will be Dr. B. P. Watson, of the Sloane Hospital for Women, New York; Dr. Herbert C. Moffitt, of the University of California; Dr. John Oille, Dr. Clarence L. Starr and Dr. J. G. Fitzgerald, of Toronto; and Dr. William Boyd of Winnipeg. The date of the meeting is June 21st, to 24th inclusive.

On March 5th, Dr. George Seldon delivered the Osler Lecture for 1927 before the Vancouver Medical Association. Before the lecture a dinner was given at which Dr. Stanley Argyle, Dr. Berry and Dr. R. J. Love, all of Melbourne, Australia, were the guests. These gentlemen are touring Canada and the United States under the guidance of the Rockefeller Foundation and the American College of Surgeons in the interests of public health and medical education, and the hospitals.

Dr. Norman D. Royle, who arrived in Vancouver on the *Niagara* on March 4th, gave an illustrated lecture before the Vancouver Medical Association at the dinner on March 5th, on his original work in connection with the autonomic nervous system.

At the general meeting of the Vancouver Medical Association held on February 1st, Dr. J. M. Pearson and Dr. C. S. McKee were the speakers. Dr. Pearson addressed the members on the subject of "Hypertension" and Dr. McKee described his interpretation of blood findings in cases of nephritis among returned men undertaken at the Shaughnessy Military Hospital.

At the clinical meeting of the Vancouver Medical Association held at St. Paul's Hospital in February interesting skin cases were shown by Dr. John Christie; Dr. W. D. Keith presented a case of bullet wound through the chest in a young man and Dr. Chas. H. Vrooman discussed the use of lipiodol in the diagnosis of chest diseases.

Dr. Wm. Sager of Port Coquitlam paid a recent visit to his old home at Port Simpson, B.C. His practice was left in charge of Dr. A. W. McCordick of Vancouver.

Dr. M. Fox, late of Atlin, is now happily recovered from his recent operation for appendicitis and is relieving Dr. P. S. McCaffrey of Agassiz who has gone east on post-graduate work.

Dr. E. J. Rothwell of New Westminster and Dr. H. C. Wrinch of Hazelton have now returned to their respective practices after a strenuous two months in the Provincial Legislature.

Dr. J. J. Gillis of Merritt, Dr. A. M. Menzies of Britannia Beach and Dr. M. G. Archibald of Kamloops were visitors to Vancouver in February.

Membership fees in the British Columbia Medical Association for 1927 are coming in rapidly and several applications for membership have been received. The executive secretary paid a two weeks visit to the doctors on Vancouver Island with excellent results. Many problems of an economic nature were dealt with.

Dr. H. Adams of Victoria is acting *locum tenens* for Dr. Roy Walker of Logan Inlet, Queen Charlotte Islands till the beginning of April.

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It is gratifying to note that a number of medical men on Vancouver Island have signified their intention of attending the Vancouver Medical Association's Summer School to be held in June next. They are, apparently, attracted by the valuable clinical programme already arranged.

Dr. A. E. Trites of Ladysmith was married on February 28th, in St. James Church, Vancouver, to Miss D. Weir of Montreal. Dr. and Mrs. Trites will reside at Cassidy on their return from their wedding trip. Dr. C. I. Margeson of Vancouver is relieving Dr. Trites.

UNITED STATES

The National Association for the Study of Epilepsy will hold its next annual meeting at Cincinnati, Ohio, on May 30th and 31st, immediately preceding and in joint session with the American Psychiatric Association.

Book Reviews

An Introduction to the Practice of Preventive Medicine. J. G. Fitzgerald, M.D., LL.D., F.R.S.C., and others. 792 pages, 130 figures. Second edition. Price $7.50. The C. V. Mosby Co., St. Louis. McAinsh & Co., Toronto, 1926.

In recent years the secrets of disease have been revealed to the human race at a very rapid rate. The application of this knowledge to the solution of problems has not kept pace with the discoveries themselves. For example our modern crusade against tuberculosis is based on knowledge which has been well understood for many years and it is not new knowledge but the utilization of what we know that in the next generation will reduce this disease to very small proportions. This tardiness of the human race to utilize scientific knowledge is more apparent in the field of preventive than in the field of curative medicine. However, there are signs of healthy activity on all sides. Philanthropists, governments, clubs and many organizations are taking great interest in these problems. Many young medical men are taking up this work as a specialty and it is to these men that we shall look for guidance. The best results, however, will only be achieved when all practioners will lend their influence to these modern trends of medicine. The busy practitioner may find it difficult to keep in touch with the many phases of preventive medicine and he will find in Dr. Fitzgerald's book just what he requires in a condensed and acceptable form. The book covers a wide range of subjects and it deals with most of them in a clear and effective manner. There is no redundancy of word or phrase.

The first 300 pages are devoted to communicable diseases and are in some respects the most attractive part of the work. Well-known facts concerning the nature and control of each disease are clearly stated and one has the feeling that these facts may be accepted as the best that is known. The text is illustrated by charts and statistical tables, many derived from Canadian sources. A fair criticism at this point is that many of the tables could have been brought more up to date. Comparative charts which stop at 1918 and in some cases earlier would be more instructive if later years had been included.

The chapters on milk, water, and food by Mr. Lancaster and on community and domestic sanitation by Mr. Gillespie are easy to read and give a very clear and satisfying presentation of many important problems of public health. The remainder of the book covers a wide variety of subjects including maternal and infant mortality, school hygiene, ventilation, industrial hygiene, vital statistics, etc., etc. It is a sort of hodge podge of subjects in which may be found many tasty morsels.

Taking the work as a whole it contains a vast amount of useful information and one is surprized that so much can be compressed into one volume. A large list of references are found at the end of each chapter. The book, as the title implies, is an introduction to the practice of preventive medicine and will be widely read by the profession.

The publishers have done their part well. The book is printed in large, legible type on good quality paper and well bound. K. A. MACKENZIE

An Introduction to the Law and Tradition of Medical Practice. William Sanderson, M.A., LL.B., and E. B. A. Rayner, B.A., LL.B. 77 pages. Price 7/6 net. H. K. Lewis & Co. Ltd., London, W.C.1, 1926.

When reading this small book one is impressed by two things: first, that the authors are both members of the legal profession; second, that it is intensely interesting as a story.

Although the subject is dealt with from the point of view of English law and custom, with here and there a reference to Scottish law, there is so much of common sense throughout that its applicability to the medical profession of any civilized land may be easily deduced.

Stress is laid upon the well-known rule that ignorance of the law is no excuse, and the statement is made by the authors that, with the exception of the members of the legal profession, the medical profession requires to know more law to govern daily duties than does any other class of the community.

The book, which consists of some 70 pages of reading matter, is admirably constructed with a view to sequence of sections and carries the reader through the consideration of the relations of medicine to the Body Politic, to contact with law, contact with patients, contracts, advertising, and the relations of physicians to each other.

The history of the origin and development of the traditions of medical practice in England and the effect these traditions have upon the profession of to-day, is a most valuable part of the volume.

In the *British Medical Journal*, January 15, 1927, the book is well reviewed; on the whole favourably. But criticism of certain details of tradition and practice are noted and in later issues of the *Journal* have provoked spirited discussion in correspondence.

To your reviewer these, so-called errors, are but of slight importance and do not detract from the general value of the work. A. T. BAZIN

Nursing Mental and Nervous Diseases. Albert Coulson Buckley, M.D. 312 pages, 57 illustrations. Price $3.50. J. B. Lippincott Co., Montreal, 1927.

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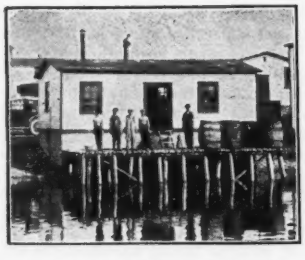

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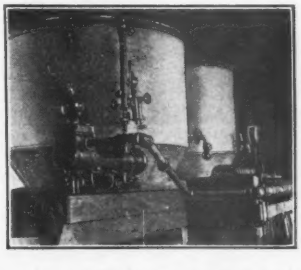

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able text for recommendation to students, this book will be welcome. It comes nearer to filling the requirements than any text that has appeared.

One feels that there are two points for criticism. The first is a failure to include a section on psychiatric social service. The social aspects of mental disease are not only of the greatest practical importance: a knowledge of them adds very definitely to the nurses' interest. Student nurses in the Psychopathic Hospital, Winnipeg, find the time spent in the social service department of decided usefulness and interest. The value of this book would be enhanced by the addition of a section on this subject.

The second criticism is that the book contains too much complex material on anatomy and physiology. The present reviewer feels that it is quite possible to ask and expect nurses to accumulate too much of this kind of knowledge. In every class of nurses there will be a few who can do it successfully but the average student nurse has neither the time nor the necessary background to enable her to assimilate more than a certain amount of such information. While one is entirely in favour of the nurse getting as much as she can, one is convinced also that there is a saturation point beyond which it is unwise to attempt to go, taking into consideration factors such as time, preliminary background, future purpose, etc.

Such criticisms must not be allowed to becloud the fact that this book has many excellent features and may safely be recommended as a logically arranged, clearly written, well illustrated text for nurses. It is better for a book to contain too much than too little and under judicious guidance, attention will be directed primarily to the portions that will prove of greatest practical value.

A. T. MATHERS

Clinical Application of Sunlight and Artificial Radiation. Edgar Mayer, M.D. 468 pages, 70 illustrations. Price $10.00. Williams & Wilkins Co., Baltimore, Md., 1926.

This is not only a study of the clinical application, but is also an extensive and thorough analysis of the nature and action of light. There is evidence throughout of the author's qualification to write on this subject. His wide clinical experience and his extensive reading have enabled him to produce a book which seems to be complete in every way. The book is replete with numerous and detailed studies, making the reading difficult and at times fatiguing. For those who are interested in gaining a thorough knowledge of the subject of light as a therapeutic agent, this book is recommended.

Beginning with an historical review, the author goes on to chapters on the physics of light, pigment production, bactericidal action, biological and biochemical action on animal and plant protoplasm, and the rôle played by light on growth and nutrition. Several interesting suggestions are made; for example, the use of light in the sterilization of water and milk and of diphtheria carriers. The sources of light, natural and artificial, the indications and contra-indications, technique and dosage and other practical matters, are dealt with in great detail.

The latter part of the book is devoted to the clinical application of light, particularly in tuberculosis, to which the author's experience has been largely limited. Employing artificial sources of light, Mayer has formed favourable impressions of their use in certain forms of this disease. He uses the term "impressions" because he is compelled to admit that "the fundamentals of bio-physics and physiology remain unsolved" and that "proof of action in some conditions cannot be given." Yet he presents excellent clinical results, supported by pathological and x-ray studies, in intestinal, laryngeal, and superficial lymph node tuberculosis. In pulmonary tuberculosis on the other hand, his results have not been particularly encouraging, though he minimizes the danger of hæmoptysis if the treatment is carefully carried out. Certain types of peritoneal tuberculosis, ocular tuberculosis, and some cases of pleural tuberculosis, yield fair results. Genito-urinary tuberculosis does not seem to be benefited greatly. The treatment of "Surgical tuberculosis" is fully discussed. The author concludes conservatively that both the operative and non-operative treatment have their places and should be applied as occasion requires. The book ends with a chapter on x-ray treatment and a scientific chapter on the influence of light on bio-chemical reactions.

D. L. MENDEL

South America. Franklin H. Martin, C.M.G., D.S.M., M.D., LL.D., F.A.C.S. Introduction by Wm. J Mayo, M.D., D.Sc., LL.D., F.R.C.S., D.S.M. 433 pages, revised. Fleming H. Revell Co., London and New York, 1927.

This is the second edition of a small volume, first published in 1923, in which an account is given of the several visits paid by some of the officers of the American College of Surgeons to the various countries of South America. It has been written by Dr. Franklin Martin, Director General of the College, and in its preparation he has been assisted by Dr. William Mayo, Dr. Corrigan, and Dr. Salisbury. The small volume contains an interesting description of each of the Latin American countries, and is fully illustrated. There is in the volume much valuable material on the hospitals, medical schools, and the medical and surgical profession in our southern continent, and it has for its principal object the creating of more friendly relations between the professions of the two continents, and the possible extension of the sphere of the already far-flung College of Surgeons. It also contains a brief summary of the history of the various countries and of the more important facts connected with their geographical, political, social, and industrial status. The work will be found an excellent summary of interesting information, not only to members of the profession but to the traveller and to the historian. At the end of the book there will be found an excellent helpful vocabulary, as well as tables of the weights and measures, both the standard and the metric systems and a comparison of the two. The work can be cordially recommended to those in need of a small, concise book on these countries, and is specially servicable to members of our profession.

A. D. BLACKADER

A Manual of Pharmacology. Torald Solmann. 3rd edition. 1184 pages. W. B. Saunders Co., London and Philadelphia. McAinsh & Co., Toronto, 1926.

This edition has been thoroughly revised and in part re-written. More recent drugs such as insulin, ethylene and parathyrin have been added. The drugs and preparations have been reviewed and made to conform to the recent (10th) revision of the *United States Pharmacopœia*. Some 1200 references have been added to the bibliography.

This is one of the most comprehensive texts on the subject of pharmacology. Drugs are grouped for the most part according to their similarity of action. The author's object has been not only to furnish a text for students and practitioners but also a reference book.

An outline of pharmacological actions especially from the point of view of their practical importance in medicine is given in ordinary type. This furnishes a concise and fairly well connected account of important facts. The student, however, at the stage in his medical education at which he is usually receiving instruction in pharmacology has a limited clinical

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background. In the discussion of pharmacological actions great stress is placed on therapeutic uses and in places one feels the student may overlook the important pharmacological actions upon which the practical applications depend. For the senior student or graduate the book is exceedingly useful.

The first part of the book deals with what is more strictly pharmacy, and includes discussions on pharmaceutical methods and standards, preparations, incompatabilities, flavouring and prescription writing.

Throughout the book both the U.S.P. and B.P. preparations of drugs are given and the more important ones indicated with an asterisk. This is particularly useful in guiding the student as to the preparations and doses with which he should be familiar.

W. G. MACKERSIE

Symbionticism and the Origin of Species. Ivan E. Wallin, Sc.D. 170 pages, illustrated. Price $3.00. The Williams & Wilkins Co., Baltimore, 1927.

In this work, the author attempts to solve the old problem of the origin of species in a new way. New species, he conceives to have originated through the repeated infection of the primitive protoplasm by bacteria, which then became included within the protoplasm as "symbionts". He visualizes more complex forms evolving from the fusion of two simple bacterial organisms; and then by a re-infection of the more complex form by another bacterium, the evolution of a still more complex type. The infecting bacteria are supposed by him to have altered not only the protoplasm of the cell or organism which they have entered, but also to have modified the germ cells of the host, so that his offspring inherited qualities which the parent did not exhibit. In this manner, he says, complex life evolved from simple forms.

To find the requisite bacteria for his theory he has exhumed an old idea that mitochondria, which are formed elements found in the cytoplasm of plant and animal cells, are in reality bacterial in nature. This idea which has been advanced in the past, discredited, and again revived, is now used to explain the origin of species.

This conception, which is the basis of the work, has been seriously criticized by Cowdry and Olitzky (*J. Exp. Med.*, xxvi, 521) on the grounds of experimental work, which finds no constant similarity between representative bacteria and mitochondria. With the initial premise undermined, the conclusions which have their foundation in this premise appear untenable.

MADGE THURLOW MACKLIN

The Elements of Medical Treatment. Robert Hutchison, M.D., F.R.C.P. 163 pages. Price 7/6 net. John Wright & Sons Ltd., Bristol, 1926.

The author of this little volume is known for his directness of style, and has given an example of it here. There is no padding, and yet the reader is given a very satisfying description of how to supply essential help to the patient.

General principles are described concisely under the headings of management, diet, drugs, specific, physical, psychic and operative treatment. The general conditions of fever, pain and insomnia are then briefly dealt with. There follows a treatment of a series of more definite disease states such as heart failure, bronchitis, kidney disease, etc.

Diet is dealt with in a very commonsense way. Drugs are employed conservatively, and the construction of prescriptions is taught without tiresomeness, and without the confusing multiplicity found in the older books.

In the chapter on diabetes is found a very simple plan of working out the approximate balance of carbohydrate. The absence of reference to many common affections, such as tonsillitis, jaundice, worms, and pleurisy cannot be criticized in a book that aims at elementary instruction, but the principal lines of treatment for skin diseases might well have replaced the section on gout. The author does not appear to have grasped the value of Collip's parathyroid extract in his reference to endocrine treatment; and on page 155, what is probably a typographical omission of the decimal point makes the intravenous saline advised, 10 times the proper strength.

This book will be particularly valuable to the student at the beginning of his clinical studies, when treatment is not much dwelt on in classes. It will help him to find his feet in the whirl of the varying cases and will give him sound ideas that should help him throughout his career.

FRED. A. YOUNG

A Text-Book of Embryology. Harvey Ernest Jordan, A.M., Ph.D., and James Ernest Kindred, M.A., Ph.D. 613 pages. 471 illustrations and 33 plates. D. Appleton & Co., New York, 1926.

The first few chapters deal with embryology, and the facts stated are more intelligible than some of those met with in many text-books. Simplicity seems to be the keynote and one is able to follow the main issues without being lost in details. The development of the placenta, umbilical cord and umbilical vesicle, is well explained in all necessary detail. Each system is then taken up separately, thus enabling the reader to use the work as a reference and readily find all the necessary information.

Particularly interesting is the account of the nervous system; and a great deal of thoughtful work has been done to explain its development. The diagrams of this portion of the book are particularly good and are most helpful in assisting one to understand the central nervous system. The last few chapters are devoted to "Teratology" and "Eugenics."

As a whole this work is well written, and forms an excellent book of reference; and may be recommended as a useful addition to a physician's library.

R. B. MALCOLM

Natural Processes of Healing in Pulmonary Tuberculosis. Marc Jaquerod, M.D., translated by J. Denny Sinclair, M.B., Ch.B. 107 pages, 60 illustrations. Price $1.75. Macmillan Co. of Canada, Toronto, 1927.

Dr. Jaquerod reminds us of the old French adage, "Time does not respect what is done without his assistance," and would have us apply it in the treatment of pulmonary tuberculosis with more insistence. Those who deal with tuberculosis especially quite realize the respect that is due to time, even to the extent of thinking of it in units which in proportion to the average span of life may well be regarded by the patient as æons. Thus it is that we find Dr. Jaquerod saying: "Not only is it necessary to devote *at least* one year to obtaining the clinical cure of pulmonary tuberculosis, but the lapse of another 12 months is required for confirming and consolidating this result . . . It is almost always in the year which follows the clinical cure that relapses occur. Once this period is passed the healing can be considered as definitive."

But those who only occasionally treat tuberculosis need the encouragement of those whose specialization enables them (to paraphrase Matthew Arnold) to "see it clearly and see it whole." We may not be able to apply the word "cure" to tuberculosis except in a limited sense, but we are beginning to understand that the disease can be checked so as to be practically negligible, and that too after it has reached extraordinarily advanced stages. Dr. Jaquerod's collection of cases with their beautifully clear skiagrams of the different stages of healing is a proof of this of the most convincing nature. This series is in itself of considerable value, but it is also supplemented by

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introductory notes on the nature of pulmonary tubercular lesions which are clear and concise. We gain the most from our experience, Dr. Jaquerod says, not so much by noting in what proportion of cases phthisis is curable, as by seeing "why it yields to treatment in some cases and not in others, by what anatomical and biological processes these cures are affected, and what are the indispensable conditions for obtaining them." H. E. MACDERMOT

Piersol's Normal Histology. William H. F. Addison, B.A., M.D. 13th edition. 477 pages; 432 figures; 43 in colour. Price $6.50. J. B. Lippincott Co., Montreal, 1927.

The thirteenth edition of this old and reliable work has just come out under the able editorship of Professor Addison of the University of Pennsylvania in an entirely new and attractive format. We note improvement in the arrangement of the matter, as, for instance, in that concerned with the endocrine glands, the various members of which are now grouped together, instead of being scattered through different chapters, as heretofore. This section contains much new information, and includes descriptions of the islets of the pancreas, the interstitial cells of the testis, and the luteal tissue and vascular follicles of the ovary.

There is evidence of considerable editorial revision, and not a little rewriting. Protoplasm is now dressed in its modern guise as a "colloidal system." The various formed bodies of the cytoplasm, such as the mitochondria and the Golgi apparatus, so much discussed of late, are given more adequate treatment. The effect of recent research work is noted throughout the text, and there are many references to latter-day contributions. Deference is shown to the modern tendency to do away with proper names in the designations, except where there is no alternative.

In a work so compact it is impossible to avoid a certain amount of dogmatism, as, for instance (p. 56) where the sweeping statement is made that osteoclasts break down and absorb newly formed bone—a view recently held in doubt (Arey, 1920).

One would like to see a more detailed treatment of the connective tissue cells, particularly the clasmatocytes, and a little fuller discussion of the latter work with vital stains. One might, perhaps, be pardoned for thinking that a better set of diagrams to show the early metamorphoses in the mammalia blastodermic vesicle could be devised than those of Figs. 15 and 16, though these have acquired a certain historical dignity.

The intestinal epithelium is quite perfunctorily treated, the minute details of the various cells being hardly touched upon. The Paneth cells are mentioned only in the intestinal glands, and the basal granular (enterochromaffin) cells, regarding which a large literature has recently accumulated, are not even named. In the tracheo-bronchial tree the elastic tissue system is inadequately dealt with.

We are glad to note a reference to insulin, but miss one to parathyrin, and also to the names of Banting and Collip.

A number of new figures have been added, many in colours, which contributes materially to the attractiveness of the book. One or two valuable ones have been omitted, as that of a section through the mediastinum testis.

The list of recent contributions to the literature will prove useful to the beginner, and so, too, will the description of innovations in the technique of living-cell study, such as the tissue culture method, micro-dissection, and supravital staining.

The work shows marked advance, and should prove valuable to students and practitioners of medicine. As an introduction to the study of pathological histology it may be commended, not only because of the clear presentation of anatomical fact, but also because of the frequent descriptions of functional form changes in cells and tissues, as in the splenocytes exposed to foreign blood, and the epithelium of the mammary gland in different physiological conditions. C. C. MACKLIN

Studies in Tuberculosis.—A biologic method has been devised by Frederick Eberson, San Francisco, for identifying specific skin-reacting substance in the blood serum of tuberculous patients and animals. A heat-sensitive skin-reacting substance of the nature of a toxin has been identified in the blood serum of tuberculous patients and guinea-pigs. It is not found in normal human or guinea-pig serum. The substance does not behave like tuberculin or its related elements which are heat-resistant, and it exists independently of these. It is present in largest amounts in far advanced tuberculous infections with profound toxæmia, and is apparently destroyed by heating at from 60 to 65 C. for from 20 to 45 minutes. In normal animals this unheated substance gives a positive skin test owing to its interaction with normal antibodies for tubercle products. The method devised for identifying this specific skin-reacting substance depends, in principle, on a living "indicator," the guinea-pig, which measures related or identical elements in the serum to be tested. The procedure was made possible by a previous demonstration that normal animals could be sensitized with fractional tuberculins prepared from nonprotein substrates. Skin reactions obtained according to the technic described in these experiments are referable to an addition or subtraction of one or more of the interacting substances present in tuberculous serum and in the tissues of the experimental animal. The heat-labile substance, probably a toxin, in tuberculous serums can be used as a measure of the circulating antibodies in normal and tuberculous persons. A test of this type may serve as an index of the bodily resistance to tuberculous infection in both groups. Certain theories and hypotheses regarding tuberculin and skin sensitiveness find controllable experimental evidence in the observations described. An explanation is offered for negative tuberculin tests in far advanced tuberculosis, and, furthermore, positive reactions with tuberculous serums in apparently normal persons are to be attributed to a toxin. —*J. Am. M. Ass.*, Jan. 29, 1927.